

# Southern Power & Industry

The Industrial and Power Journal of the South & Southwest

APRIL, 1958

SPI ... 55th Year

REACHES industrial plants (manufacturing, process, utility and large service) in the South & Southwest.

SERVES plant managers, superintendents, engineering department heads and plant operating staffs.

PROVIDES information to solve design, installation, operating and plant maintenance problems.

Complete Contents Page 3



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University Microfilms  
315 No First St  
Ann Arbor Mich

STAFF CORRESPONDENT

TO RES - Porch.

DATE 4/11

FROM T.W.M. - Maint.

Bot - How about these new epoxy resin coatings?

Might stop that corrosion and peeling we were talking about. They are supposed to resist condensation, etc.

Take a look at page 48 and please order bulletins.  
Thanks - Mac.

ALL IN A DAY'S WORK at *Pittsburgh Piping*

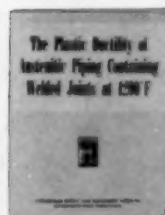
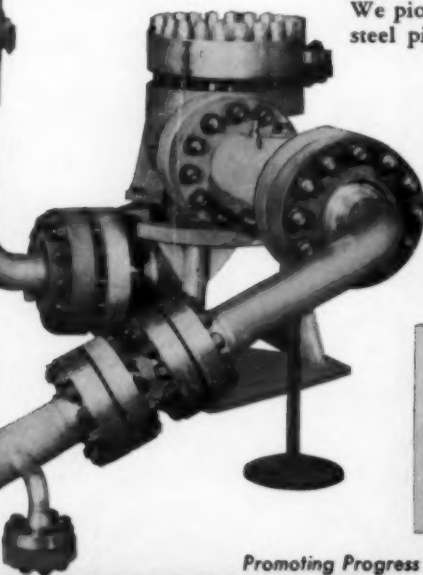
## STAINLESS STEEL AUTOCLAVE and VOLUTE Shop Fabricated



by

*Pittsburgh Piping*

This autoclave and volute assembly is typical of the work that goes through Pittsburgh Piping shops. Fabricated of Type 304 Stainless Steel, it is complex in design and is built for high pressure, high temperature service. This type of fabricating is a "natural" for Pittsburgh Piping. We pioneered the application of austenitic steel piping materials for central stations operating at 1050°F. and above, and fabricated the piping for the world's first atomic-powered submarine and central station. Highly specialized methods, machines, and apparatus have been developed and are employed in this work. Use them on your high temperature, high pressure piping jobs.



### WRITE FOR YOUR COPY

This bulletin reports on intensive investigation into the problem of main steam piping materials and gives data on the stress rupture characteristics of Types 316 and 347 stainless steel piping adjacent to welded joints.

Promoting Progress **IN POWER AND PROCESS PIPING**

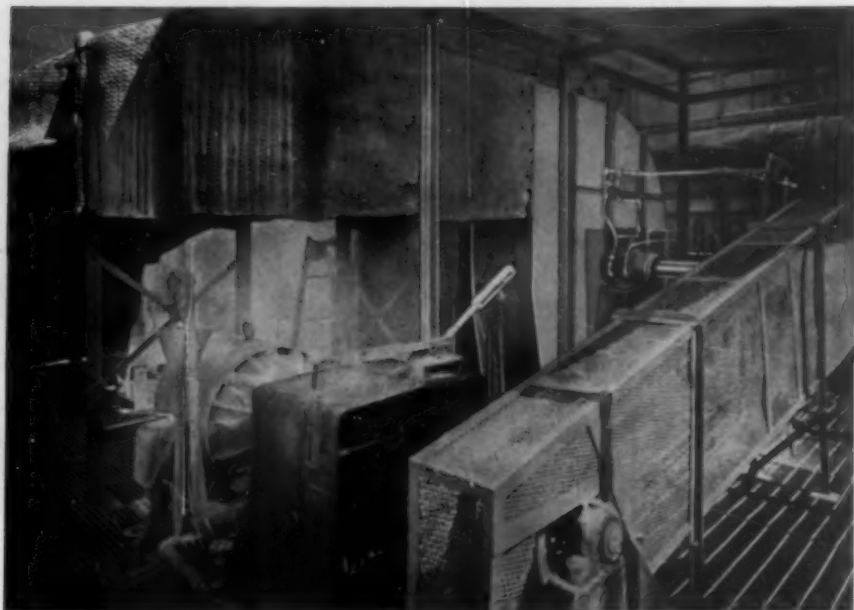
*Pittsburgh Piping*

**AND EQUIPMENT COMPANY**

155 40th Street — Pittsburgh, Pa.

Canada: **CANADIAN PITTSBURGH PIPING, LTD.**, 68 YONGE ST., TORONTO, ONTARIO

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Chicago	Peoples Gas Building	New Orleans	P. O. Box 74
	New York	Woolworth Building	



One of several Clarage Type XL Fans used in this application. Fan equipped with stainless steel wheel and V-belt driven from a hydraulic coupling.

## ***Clarage Fans have what it takes***

**for this tough exhaust assignment in  
the production of titanium dioxide**

Exhausting 800° F gases from rotary calciners through scrubber units and electrical precipitators to the atmosphere.

That's the demanding task this large chemical manufacturer gave Clarage Type XL Fans.

What kind of a job evaluation does Clarage receive? Several repeat orders furnish the answer. In fact, three additional Clarage Fans will soon be installed in a major expansion at this plant.

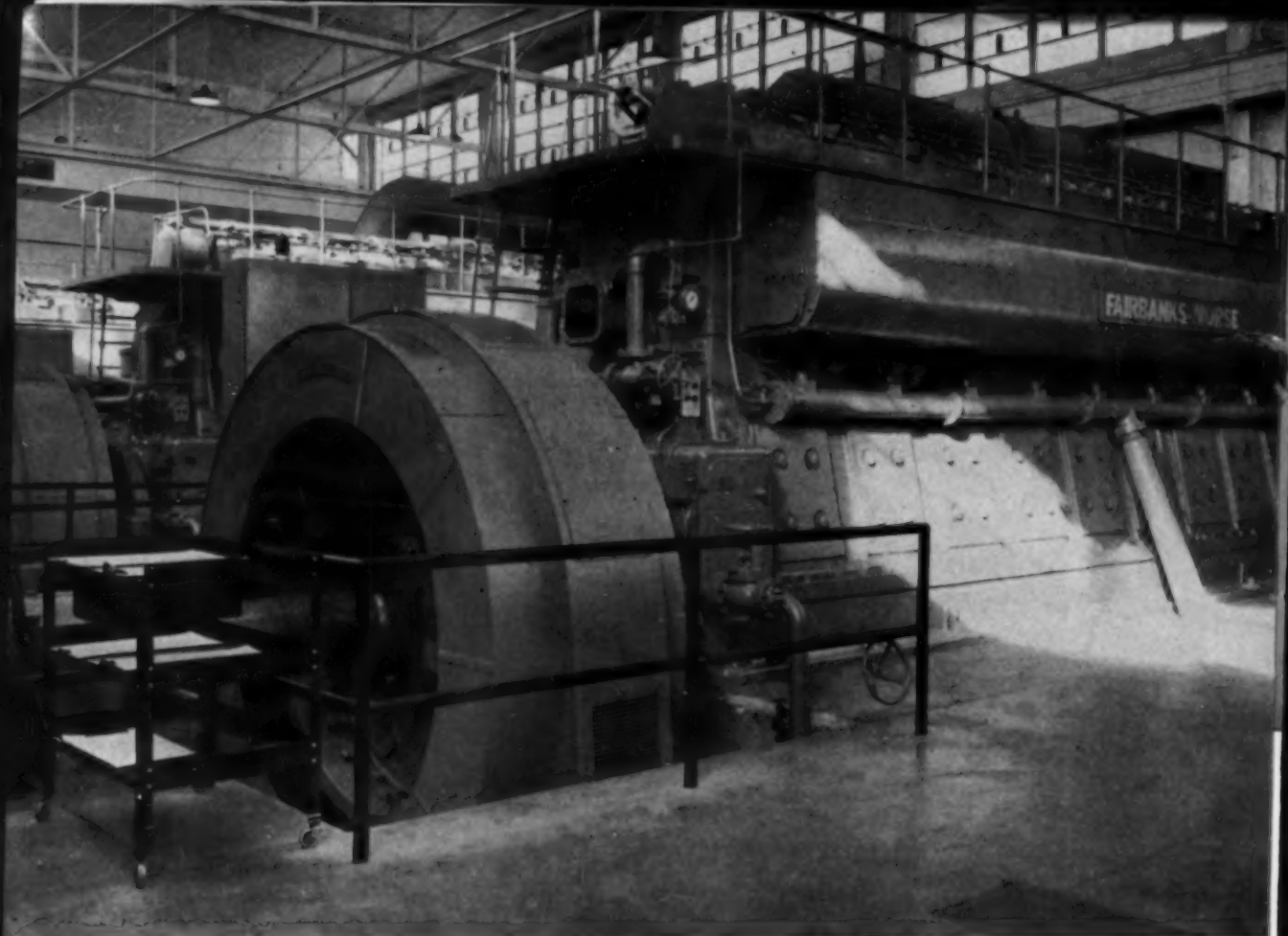
You, too, will find it pays dividends to choose the fan name of quality — Clarage. Call us in for capable assistance on your next requirements in the air handling and conditioning field. It's characteristic of Clarage equipment to prove out successfully no matter how exacting the application. CLARAGE FAN COMPANY, Kalamazoo, Michigan.

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**... dependable equipment for  
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SOUTHERN POWER & INDUSTRY for APRIL, 1958

For more information, use Reply Card—Page 97



## 4 reasons why cost-conscious engineers specify **TEXACO Ursa Oil Heavy Duty**

Increasing the output of the individual engine is one way to hold the line on rising operating costs. And effective lubrication can play a major role in increasing diesel efficiency. That's why more engineers are specifying Texaco Ursa Oil Heavy Duty for optimum diesel operation. Here are the reasons:

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*power in the U. S. has been lubricated with Texaco than any other brand.*

A Texaco Lubrication Engineer will gladly give you full details on the lubrication needs of all diesel, gas and dual-fuel engines. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.



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(PARTS, INVENTORY, PRODUCTION, DOWNTIME, MAINTENANCE)





# Southern Power & Industry

The Industrial and Power Journal of the South and Southwest

Eugene W. O'Brien  
Managing Director

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# Facts and Trends

April 1, 1958

- ◆ **THE BOOMING SOUTH-SOUTHWEST** — Metalworking growth pattern is amazing and the Metal Shows are moving South. Dallas, Texas opening is scheduled for May 12th and a Southeastern Show is planned for 1960. See page 8 for details.

New Plants & Expansions (pages 8-28) feature an \$18 million Oklahoma high-energy fuel plant, \$1 million maintenance shop at Baton Rouge, La., and an \$9 million Goodyear plastic plant in West Virginia.

With over 100 aircraft and missile plants, major research and development centers, most favorable climatic conditions and ample space for plant dispersion, the South is now the center of some of the nation's most advanced aeronautical programs. See page 47.

- ◆ **EPOXY RESIN COATINGS** are very successfully used at the Ecusta Paper Div., Olin Mathieson Chemical Corp. in the Carolinas as protection against severe chemical and corrosive exposures. Paint testing procedures, selection & standardization, surface preparation, application, and materials and labor costs are summarized on pages 48-50.

- ◆ **RADIOISOTOPES** — American manufacturers now report annual savings of over \$120 million through the use of versatile radioisotopes. On pages 52-55, John F. Lee, SPI Consultant on Atomics, reports on types, availability, costs, and applications.

- ◆ **WATER HAMMER** — Danger of inadequate drainage as a cause of misoperation of valves on steam piping is demonstrated on page 60. Bring these facts to the attention of all personnel responsible for placing steam lines and equipment in operation.

- ◆ **ELECTRONIC GROUND ALERT** — You can detect line-to-ground faults immediately with Delta-Desco's electronic ground alert, portable and stationary units which can be connected to your 220 or 440/40 volt, 3 phase electrical system.

A green light burns continuously when your system is normal. When a ground occurs in any phase the green light goes out and a red light flashes on and a bell rings until switched off or the system cleared. Check details on page 94.

- ◆ **METAL FIRES** — Magnesium, titanium and zirconium are highly flammable. Compared with other extinguishents in respect to this hazard, TMB liquid, developed by Callery Chemical Co., forms a molten coating that excludes the atmosphere from metal fires, giving off fumes that are virtually non-toxic. Check details on page 86.

(Continued on Page 6)

# An improved Combination Starter for extra safety

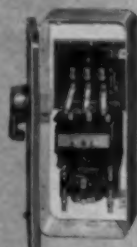
While the changes in the new Allen-Bradley Bulletin 712 and Bulletin 713 starters may be relatively minor, they were made in your interest—to give you the best control on the market.

The new operating lever has been attractively restyled and structurally improved. Now the disconnect switch can be locked "open" or locked "closed"—with three padlocks of any kind. For the maintenance engineer, a concealed latch pin is built into the lever, which permits opening the door of the cabinet without opening the disconnect switch and stopping the motor. The door can also be padlocked shut independently of the operating lever.

With the disconnect lever in the "off" position, the cabinet door can be opened. At a glance, it can be seen that the movable contacts are open. An added "safety" feature—the incoming line connections are covered with an insulating plate to prevent accidental contact.



BULLETIN 712 COMBINATION STARTERS



Size 2—to  
15 hp, 220 v;  
25 hp, 440-550 v.



Size 1—to  
7½ hp, 220 v;  
10 hp, 440-550 v.



Size 3—to  
30 hp, 220 v;  
50 hp, 440-550 v.



Size 4—to  
50 hp, 220 v;  
100 hp, 440-550 v.

## ALLEN-BRADLEY

## QUALITY MOTOR CONTROL

Allen-Bradley Co., 1328 S. Second St., Milwaukee 4, Wis. • In Canada—Allen-Bradley Canada Ltd., Galt, Ont.

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## **Facts and Trends (Continued)**

- ◆ **TEFLON GEARS** are being successfully used in rotary pump operation. Eco Engineering Co.'s rotary gear pump for non-lubricating and corrosive fluids features Teflon gears and internal Teflon bearings and packing. Check details on page 94.

- ◆ **PIPING LAYOUTS** — A 36 page collection of 25 basic piping diagrams with complete recommendations for valve selection and location in the lines is available to consulting engineers, plant operating personnel, and other specification writers.

"Practical Piping Layouts" covers industrial plant air compressors, waste treatment systems, water softening systems, automatic combustion control, etc. For your complimentary copy ask for Volume No. 3 on your company letterhead — Write Jenkins Bros., Room 42, 100 Park Ave., New York 17, N. Y.

- ◆ **TRANSISTOR SYSTEMS** in use at the Savannah, Georgia plant of du Pont are reported to have the following advantages over conventional systems utilizing vacuum tubes — reliability, small size, lower power requirements and lower cost. They have been found to cost less to fabricate than comparable conventional instruments and have very low power requirements.

- ◆ **HIGH FREQUENCY** can increase the light and life of your fluorescent lights. About 40 test installations coupled with recent new developments indicate a better performing lighting system may be installed using high frequency for an initial cost of the same or slightly less than the conventional lighting systems.

Cost of operation has been reduced up to 25% in some installations. If you are building a new plant, expanding, or modernizing, check with your power company's lighting sales engineer on the advantages of high frequency systems.

- ◆ **DRAINING CORROSIVE LIQUIDS?** — Spent acids and other liquid wastes of industry are being drawn off more economically in polyvinyl chloride piping. Changes in direction are made with socket type solvent welding drainage fittings. The plastic piping is replacing cast iron and ceramic lines, which employ conventional bell and spigot fittings, where corrosive solutions are conveyed at low pressures.

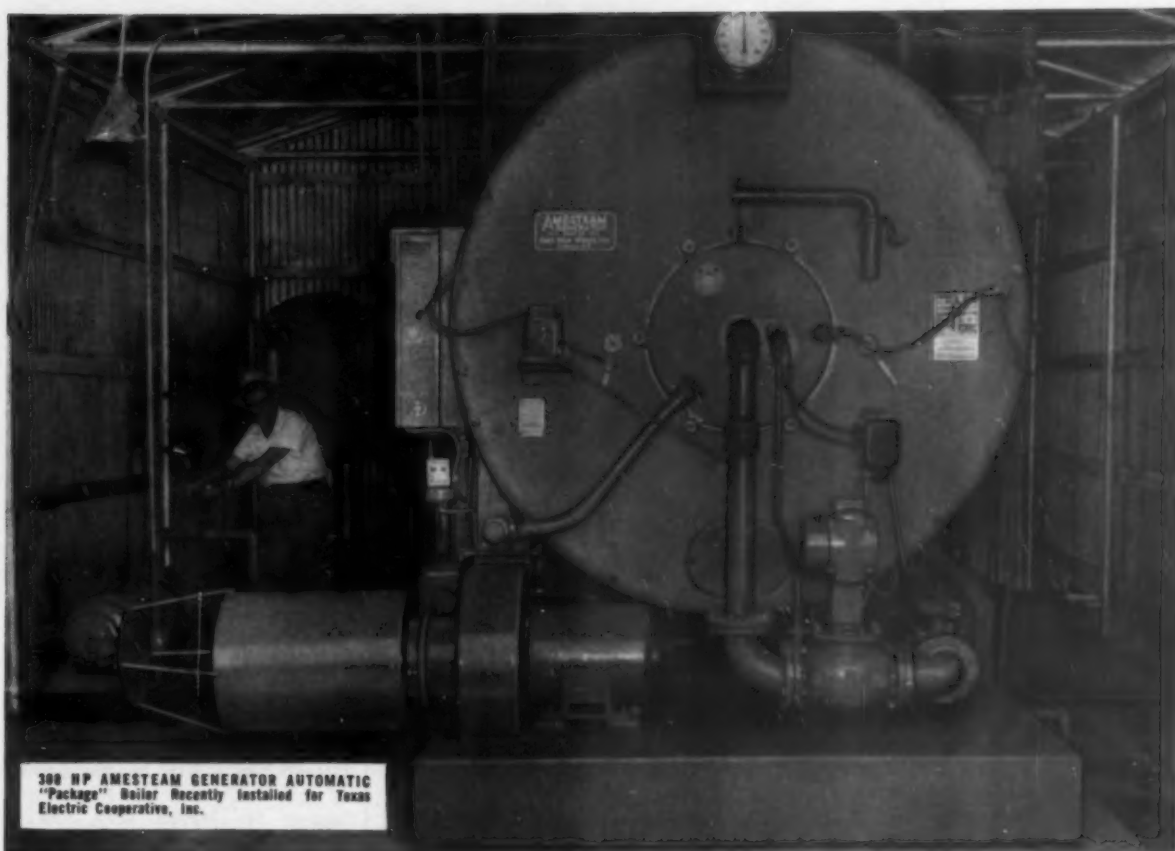
Reasons for the switch include: PVC plastic pipe and most fittings cost less, less labor per joint, fewer tools and materials needed, fewer joints required, useless deadweight eliminated, no losses due to breakage, and piping is not subject to galvanic or electrolytic action.

- ◆ **SPI's 12th Annual PLANT MAINTENANCE ISSUE** will be in your office on May 1 presenting "plant-tested" procedures to reduce maintenance costs, save materials and improve operations.

**Men — IN THE PLANTS** — are the fellows who consider equipment details, provide service experience, estimate performance and consider maintenance costs and equipment dependability.

Once again, in this important issue, Southern & Southwestern maintenance and operating personnel explain their problems and tell how they have overcome difficulties and improved service. Watch for the big May Maintenance Issue!





300 HP AMESTEAM GENERATOR AUTOMATIC "Package" Boiler Recently Installed for Texas Electric Cooperative, Inc.

TEXAS ELECTRIC COOPERATIVE, INC.  
**Cuts Fuel Consumption Over 36%**  
**Saves Over \$15,000 per year**  
**... with AMESTEAM**  
**GENERATOR**

**We Quote the Money-Saving Facts:**

"We were very pleased when we replaced two gas-fired boilers in our pressure testing plant with one new 300 HP AMESTEAM GENERATOR Automatic "Package" Boiler. The new Ames unit has reduced our fuel costs alone by 38% ... a saving of \$7,800 per year.

"Because our new AMESTEAM GENERATOR is entirely automatic, three firemen are now transferred to other duties. This results in an additional saving of \$7,200 per year.

"This total saving of \$15,000 per year does not include the considerable savings in maintenance costs. On top of this, the new Ames installation increases our production potential

by 20% to 30% ... with much higher quality steam."

We at Ames continually receive letters like this from the enthusiastic users of AMESTEAM GENERATORS. Ames customers are *satisfied* customers. They know that when they buy AMESTEAM GENERATORS, they buy **LOWER-COST STEAM!**

**What's Your Steam Problem?**

If you need 10 to 600 HP and want the kind of space-saving, trouble-free service enjoyed by satisfied users of AMESTEAM GENERATORS, contact your nearby AMESTEAM Dealer or write for our Catalog.

**AMES IRON**  
**WORKS INC.**  
 BOX L-48 OSWEGO, N. Y.

**AMES IRON WORKS**  
 BOX L-48, OSWEGO, N. Y.

Gentlemen:

Please send me further information on AMESTEAM GENERATORS and name of nearest representative.

NAME .....

COMPANY .....

ADDRESS .....



## Metal Shows Move South — Dallas Opening

**Southwestern Exposition in Dallas, Texas  
May 12-16th — Southeastern Show in 1960**

Metalworking is on the move throughout the South and nowhere is industrial change more apparent than in the Southwest, scene of the first great Southwestern Metal Congress and Exposition.

Over 200 outstanding firms will recognize this vital industrial development by exhibiting in the **Southwestern Metal Exposition and Congress** in Dallas, May 12-16. Operating exhibits in the big, convenient State Fair Park (only two miles from downtown Dallas) will bring metal experts to discuss your problems.

Daily technical and practical programs during the concurrent South-

western Metal Congress will present scientists and engineers in panel discussions. Twenty-eight technical papers are scheduled, all prepared with the metalworking industry of the Southwest in mind.

**High Temperature Service** (Monday, May 12) — Protection of High Temperature Materials, Rapid Testing at High Temperatures, Fabricating Techniques, Joining and Inspection of Joints, etc.

**High Strength Steels** (Tuesday, May 13) — Chromium Ultra High Strength Steels, Steel Forgings, Machining & Fabrication, Embrittlement, etc.

**New Fabrication Techniques** (Wed-

### Metal Expositions Sponsored by ASM

The Southwestern Metal Exposition and Congress in Dallas, Texas, May 12-16 is sponsored by the 30,000 member **American Society for Metals** with headquarters at 7301 Euclid Avenue, Cleveland 3, Ohio.

**William H. Eisenman** is Managing Director and **Chester L. Wells**, Assistant Director. **Ted DuMond** is Secretary of the ASM Metals Engineering Program Committee.

nesday, May 14) — Ultrasonic Machining, High Speed Machining.  
(Continued on Next Page)

## \$38 Million Muskogee, Oklahoma High-Energy Fuel Plant for Navy

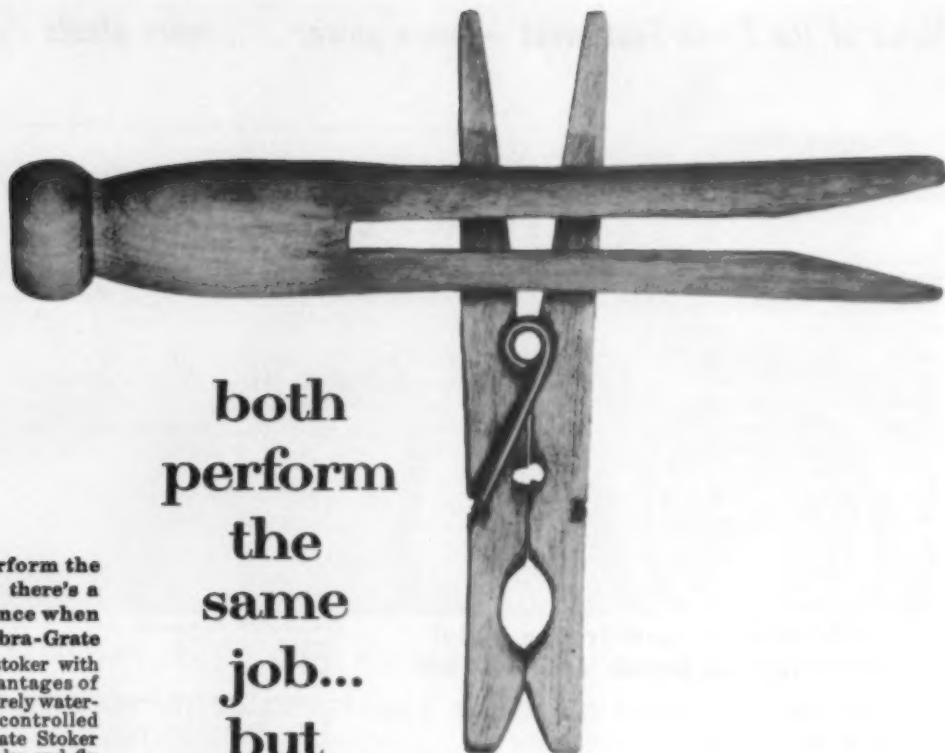
The world's largest high-energy fuel plant being constructed for the Navy at Muskogee, Oklahoma, is scheduled for completion late in '58. The plant will produce tonnage quantities of the new exotic fuel developed from high-energy boron compounds to power jet aircraft and missiles.

Callery Chemical Company of Pittsburgh is the prime contractor and the Girdler Construction Division of National Cylinder Gas Company, Louisville, Kentucky, is furnishing all engineering, apparatus, material and complete field construction and start-up services for the high-purity industrial gas plants.

## Diversey Expands in Southwest Area

The Diversey Corporation of Chicago, manufacturer and distributor of chemical products and detergents for industrial use, recently bought a five-building plant in **Waco, Texas** and has relocated its southwestern division headquarters there.

Property consists of two warehouses, an insecticide plant and air-conditioned office building. Diversey is manufacturing insecticides, disinfectants, industrial cleansing products and bottle-washing compounds for Southwestern manufacturing, process and service plants.



both  
perform  
the  
same  
job...  
but  
there's  
a  
difference!

Steam plants all perform the same job, too... but there's a very decided difference when you choose AE's Vibra-Grate Stoker. For here's a stoker with everything... the advantages of others rolled into one entirely water-cooled, automatically controlled unit. The AE Vibra-Grate Stoker gives freedom from smoke and fly ash at both high and low ratings... eliminates need for dust collectors and cinder return systems... burns low-grade coals efficiently... is readily adaptable for burning gas or oil either singly or in combination with coal.

The Vibra-Grate Stoker feeds and moves the fuel automatically by intermittent vibrating motions, insuring even distribution and avoiding holes and light spots in the fuel bed. Its highly effective water-cooling system guarantees long grate life with proved maintenance of less than 2/10 cents per ton of coal burned.

The Vibra-Grate is years ahead in design efficiency, yet its over-all cost is low. If you're thinking of adding a new power plant or modernizing your present one, write today for details of the Vibra-Grate... you won't be disappointed.

**Other outstanding stokers made by American Engineering Company are:**

**TAYLOR STOKER:** an underfeed stoker for power requirements ranging from 20,000 to 500,000 pounds.

**PERFECT SPREAD STOKER:** a spreader stoker with spiral-type rotors and continuous chain feeders for both lateral and longitudinal coal distribution.

**GRATE DRIVE...** intermittent vibrating motion of grate. Electric timer determines frequency of vibration controlled by fuel and steam demand.

**ADJUSTABLE ASH DISCHARGE...** retards ash discharge until complete combustion is effected.

**DAMPER CONTROLLED AIR INLETS**

**GRATE SUPPORT...** flexibly supported on division plates forming the zoned air sections of the windbox.

**GUILLotine GATE...** controls fuel bed thickness.

**OVERFIRE AIR...** provided for smokeless combustion.

**WATER COOLING...** directly connected into the boiler circulation.

**TUYERES...** air supplied to fuel bed through high-resistance grate formed of tuyeres, embracing water-cooled grate tubes... insuring long grate life.



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Montreal, P. Q., Bawden Industries Ltd., Toronto, Ont.*

## Southwestern Metal Exposition & Congress (Contd.)

Chemical Milling, Adhesive Bonding, Welding, etc.

**Corrosion in Process Industries** (Thursday, May 15) — Cost of Corrosion, Metallic Coatings for Protection, Non-Metallic Coatings, High Temperature Problems, Cathodic Protection, etc.

The Society for Non Destructive Testing is also sponsoring a four-day program in conjunction with the Show.

## Exhibitors at Southwestern Metal Exposition — Dallas, May 12-16th

### AS OF MARCH 15TH

Alexander Machinery Co., Inc.  
Alloy Engineering & Casting Co.  
American Brake Shoe Co.  
American Herforder Corp.  
American Machine & Foundry Co.  
American Machine & Metals, Inc.  
American Pulmax Co., Inc.  
American Society for Metals  
Ameco Metal, Inc.  
Arcweld Manufacturing Co.  
Aronson Machine Co.  
Atlantic Machine Tool Works, Inc.  
Atlas Press Co.  
Auburn Wire Cloth Corp.

Baird-Atomic, Inc.  
Baldwin-Lima-Hamilton Corp.  
Battelle Memorial Institute  
Barada & Page, Inc.  
Bausch & Lomb Optical Co.  
Bearing, Chain & Supply Co.  
Beckett-Harcum Co., Inc.  
Bede Products Corp.  
Bendix Aviation Corp.  
Bentley Industrial Corp.  
Blakelee & Co., G. S.  
Boice Gages, Inc.  
Braun Corporation  
Brinkmann Instruments, Inc.  
Brown & Sharpe Mfg. Co.  
Buck Tool Co.  
Budd Company  
Buehler, Ltd.

Chemical Contour Corp.  
Chicago Rivet & Machine Co.  
Clausing Division  
Clementina Ltd.  
Cleveland Grinding Machine Sales, Inc.  
Cobalt Information Center  
Commander Mfg. Co.  
Commerce Dept. (U.S.)  
Commercial Shearing & Stamping Co.  
Crow, Inc., W. Pat.  
Cunningham Bearing Co.  
Curtin & Co., W. H.

Delpark Corporation  
Delta Power Tool Division  
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Detroit Testing Machine Co.

De Walt Div.  
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Elastic Stop Nut Corp. of America  
Electric Furnace Co.  
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Gulf Oil Corp.

HPL Manufacturing Co.  
Hacker & Co., Inc., William J.  
Hainge Co., Inc.  
Harco Engineering  
Harnischfeger Corp.  
Harris Calorific Co.  
Harshaw Scientific Division  
Hart Industrial Supply Co.  
Harvey Aluminum  
Haylett O'Neill & Son  
Heath Engineering Co.  
Heiler Tool Co.  
Heppenstall Co.  
Hevi-Duty Electric Co.  
Hobart Brothers Co.  
Houghton & Co., E. F.  
Howard Foundry Co.  
Hunter Douglas International Corp.  
Huster Machine Tool Co.

Index Industrial Corp.  
Industrial Filtration Co.  
Industrial Press  
Industrial Scientific, Inc.  
Instron Engineering Corp.  
Ipsen Industries, Inc.

Jiffy Disintegrators, Inc.

KSM Products, Inc.  
Kerns Co., L. R.  
Kerns Pacific Corp.  
Kinetrol Company  
King Tester Corp.

## Metalworking Growth Pattern of the South . . .

"The South has some 50% more potential for growth for the metal industries than the West. In almost any analysis, the entire South will show a volume of total manufacturing more than twice, and sometimes nearly four times that of the West, and in some cases more than half as much as the North.

Based on S.I.C. figures of the U. S. Department of Commerce, a current ASM market survey also shows that "growth patterns for the South and West compared with the North are almost fantastic. The South for manufacturing value added is currently the leader over the West by 51% despite advances made in the West up to 1954."

Laboratory Equipment Corp.  
Lake Chemical Co.  
Lee Co., K. O.  
LeFell Mfg. Co.  
Leitz, Inc., E.  
Lemco Industrial, Inc.  
Linde Company  
Littell Machine Co., F. J.  
Ludlow-Saylor Wire Cloth Co.  
Lufkin Rule Co.

M.B.I. Export & Import Ltd.  
Machinery (Publ.)  
Magnaflex Corp.  
Malayan Tin Bureau  
Mallory-Sharon Titanium Corp.  
Man-Au-Cycle Corp. of America  
Markal Co.  
Marshall Steel Co.  
Mathews Steel Stamp Co.  
Melroy Manufacturing Co.  
Metal Progress (Publ.)  
Metal Removal Co.  
Metals Engineering Institute  
Metals Review (Publ.)  
Met-L-Chek Co.  
Midcap Bearing Service  
Mid-Texas Mfg. Co.  
Miller Fluid Power Division  
Modern Manufacturing Co., Inc.  
Monarch Tools, Inc.

National Carbon Co.  
National Cylinder Gas Co.  
National Diamond Laboratory  
Newall Group Sales, Ltd.  
New England Tap Co.  
Nicholas & Parks Machinery Co.  
Nordson Corp.  
North American-Viking Drill Co.  
Nuclear Systems Division

Oakite Products, Inc.  
Olsen Testing Machine Co., Tinius

Pacific Scientific Co.  
Pako Corp.  
Pastushin Aviation Corp.  
Phillips Manufacturing Co.  
Pioneer-Central Division  
Pinsamadyne, Inc.  
Porter Co., Inc., H. K.  
Precision Carbide Co.  
Precision Manufacturing Co.  
Precision Shapes, Inc.  
Production Machine Co.

Rankin Bros. Eng. & Sales, Inc.  
Reichert Optical Works  
Republic Drill Co.  
Riehle Testing Machines Division

Rockwell Manufacturing Co.  
Rotherm Engineering Co., Inc.  
Rowe Machinery & Mfg. Co., Inc.

S & S Machinery Co.  
Sargent & Co., E. H.  
Scherr Co., Inc., George  
Scott Paper Co.  
Shilstone Testing Laboratory  
Short Run Stamping Co.  
Sieburg Industries, Inc.  
Simonds Abrasive Co.  
Simonds Saw & Steel Co.  
Sinclair Refining Co.  
Smith Welding Equipment Corp.  
South Bend Lathe Works  
Southern Extrusions, Inc.  
Southwest Air Equipment, Inc.  
Southwestern Engineering & Equipment Co.  
Southwestern Gage Co.  
Southwestern Laboratories  
Spee-Flo Co.  
Stark Co., Dutch  
Starrett Co., L. S.  
Steel City Testing Machines, Inc.  
Stewart-Warner Corp.  
Sunbeam Corp.  
Superior Heat Treating Co.  
Superior Standards Mfg. Co.  
Supreme Products Corp.

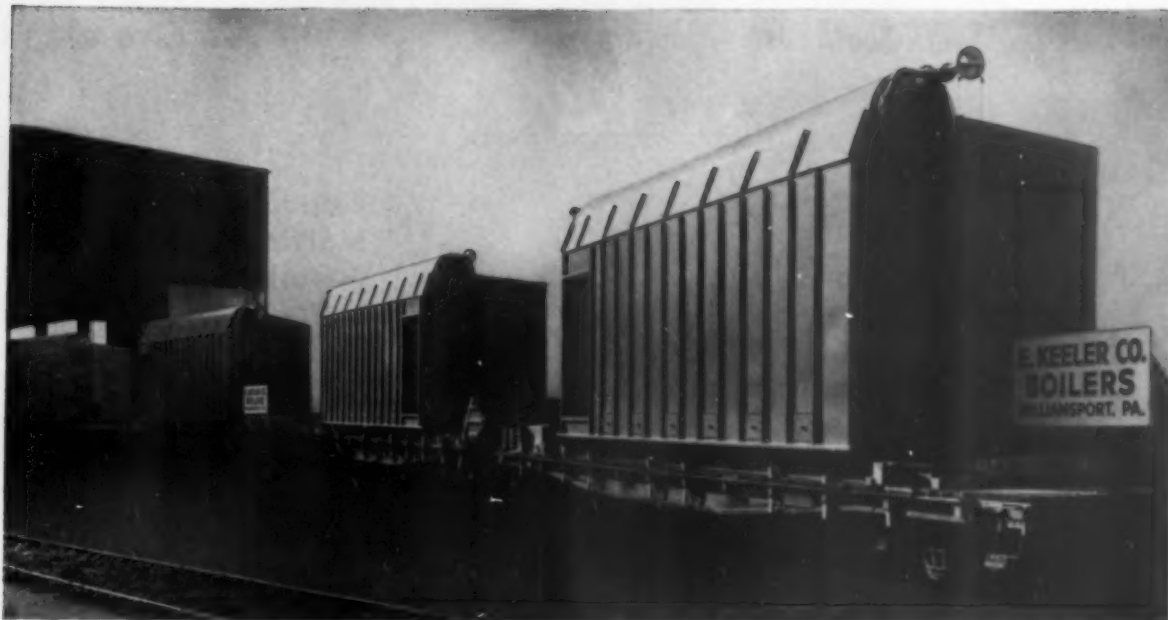
Tatnall Measuring Systems Co.  
Tech-Pacific Corp.  
Texas Aircraft Milling, Inc.  
Texas Electric Steel Casting Co.  
Texas Foundries, Inc.  
Texas Steel Co.  
Tool Supply & Engineering Co.  
Torsion Balance Co.  
Trinity Forge, Inc.  
Tru-Seal Division  
Turco Products, Inc.

Union Carbide Corp.  
United States Automatic Corp.  
United States Chemical Milling Corp.  
U. S. Dept. of Commerce

Vac-U-Mation Div.  
Viking Drill & Tool Co.  
Vinson Steel & Aluminum Co.

W-L Molding Co.  
Waldes Kohinoor, Inc.  
Wells Manufacturing Corp.  
West Point Mfg. Co.  
Westinghouse Electric Corp.  
Wilson Mechanical Instrument Co.  
Womack Machine Supply Co.  
Woodworth Co., N. A.  
Wyman-Gordon Co.





## Four 50,000-lb. capacity Keeler D-K Package Units to supply major auto producer's steam requirements

The four large package steam generators above are shown just outside the recently completed KEELER package unit assembly plant, ready for shipment to a major automobile manufacturer.

Oil-fired, each of these KEELER D-K steam generators have a capacity of 50,000-lbs. of steam per hour at a maximum design pressure of 200 psi. They were selected for their ability to efficiently supply a more flexible steam load in the purchaser's heat and process requirements. The complete package includes all burning equipment, controls, safety devices and accessories—ready for quick hook-up and operation.

KEELER water tube steam generators of various types and sizes are serving this user in several plants throughout the country. Satisfaction with previous installations and the KEELER reputation as a builder of better boilers since 1864 led to this repeat order.

Type D-K KEELER package steam generators are



"Front end" closeup view shows side gas outlet; burners mounted on wind box; and soot blowers piped to the main control valve on the D-K's steam drum.

compact package power plants, made in oil or gas fired units with capacities up to 60,000-lbs. of steam per hour. Standard design pressures range from 200 to 500 psi. They incorporate the popular D-type tube arrangement in a completely steel encased package, with water cooled and insulated furnace sides, roof and floor as well as front and rear walls.

Write for illustrated bulletin containing full specifications on these compact Package Power Plants.

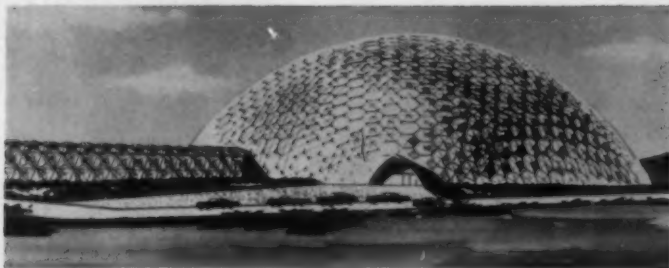
**E. KEELER COMPANY**  
West & Church Sts. • Williamsport, Penna.

ESTABLISHED 1864

The Seal of Quality  
in Water Tube  
Steam  
Generators



Interior view of new Keeler assembly shop shows D-K units in various stages of completion. D-type tube arrangement can be seen in the foreground unit.



### **\$1 Million Maintenance Shop for Union Tank Car Co. — Baton Rouge**

This all-steel "Union Dome" — believed to be the world's largest circular building without internal supports — is being built in Baton Rouge, La. by the Union Tank Car Company of Chicago.

The 10-story high geodesic structure (at right) is 375 ft across its interior base and 116 ft high at its center. A special paint area (at left) is 200 ft long and 20 ft high. Cost of the "Union Dome" and the tank car repair facilities it will house is

in excess of \$1,000,000, considerably less than the conventional car repair shop of this size. It is believed to be the first major industrial use of a dome structure in this country.

R. A. Lehr will be superintendent of the new shop and J. O. Ramsey, assistant superintendent. All types of service now performed at Union Tank's current shop, which has been in Baton Rouge since 1925, will be handled at the new location, and other new ones will be added.

### **Florida's \$18 Million Martin-Orlando Plant in Full Production**

The Martin Company's multi-million Orlando, Florida plant, in full production for the past three months, is manufacturing missiles and electronic control systems. Plant is the largest industrial structure in Florida that is completely air conditioned. \$1 million, 3,300 ton refrigeration system provides humidity and dust control and employee comfort.

Other facts and figures — plant water requirements in excess of 500,000 gallons daily; power requirements — 18 million kwh annually; 163 ft water tower with half-million capacity; \$350,000 waste treatment installation; 6,777 acre site; 500,000 sq ft in five buildings; seven parking lots for 2,500 cars; five miles of company roads; and production areas designed to meet changing patterns of product requirements.



### **GEORGIA'S RABUN MILLS, INC. COMPLETING PLANT EXPANSION**

A plant expansion at Rabun Mills, Inc., a wholly-owned subsidiary of James Lees and Sons Company at Rabun Gap, Georgia, is nearing completion. It provides space for the blending of wool and man-made fibers, the dyeing of wool and other fibers and the dyeing of yarns and carpets.

Robert and Company Associates of Atlanta, Ga., are the Architects and Engineers, and the General Contractor

is Potter-Shackelford Construction Company of Greenville, S. C.

Also being constructed to complement the foregoing operations is an addition to the water pumping station, a complete filter plant, an addition to the steam power plant and an industrial waste treatment plant.

The Rabun Gap facility is built on a 295-acre site and when fully completed this year will have complete dyeing facilities as well as the most modern fiber blending and carpet tufting operations. It has total floor space of over 200,000 sq ft and will employ several hundred persons, according to William L. Jarrett, plant manager.



Precision-made parts are assembled on site. Even large buildings go up fast—"move in" time is reduced.



Rigid frame design permits floor-to-ceiling, wall-to-wall use of space. Buildings can be completely insulated.

## Why Armco Steel Buildings give you more value for your money



Buildings can easily be enlarged or modified by adding standard units.



Note that the overhead crane has free access to all sections of the building.

Armco Steel Buildings give you more solid value for your building dollar. The reasons: Basic Armco plans save preliminary design and engineering costs. Factory-engineered parts are delivered to your site ready for rapid assembly. Standard panels lock together quickly, then are bolted top and bottom. This modern technique saves many costly steps of conventional construction.

The saving goes into the quality of the building, too.

In an Armco Steel Building you get a weathertight structure that withstands greater wind and snow-loading. The aluminum-coated or zinc-coated steel panels assure extra durability. Maintenance costs are greatly reduced, too.

Attractive, long-lasting steel buildings are available in more than 5000 sizes, from 28 sq. ft. to more than 100,000 sq. ft. with clear spans up to 100 ft. Interiors can be finished just like any other building.

Before you make a decision on your building needs, be sure to get the full story on Armco Steel Buildings.

### ARMCO DRAINAGE & METAL PRODUCTS, INC.

#### DIXIE DIVISION

P. O. Box 1343 • Atlanta, Georgia

#### SOUTHWESTERN DIVISION

C & I Life Bldg. • Houston, Texas  
Other Offices in Principal Cities

Send information on Armco Steel Buildings for the following uses:

Approximate size \_\_\_\_\_

Name \_\_\_\_\_

Street \_\_\_\_\_

City \_\_\_\_\_ Zone \_\_\_\_\_ State \_\_\_\_\_

## ARMCO STEEL BUILDINGS





### **\$1 Million Knitting Plant for N. C.**

Construction is underway on a knit cloth manufacturing plant for **P. H. Hanes Knitting Co.** along South Stratford Rd. in **Winston-Salem, N. C.**, adjacent to the company's recently modernized spinning plant. Mill No. 3 is being demolished to make room for the new plant which will have a frontage of 500 ft and which will cost more than \$1,000,000, exclusive of equipment.

Robert and Company Associates, Atlanta, Ga. are architects and engineers for the plant. General contractor is Rea Construction Co. of Charlotte, N. C. Completion of the 105,000 sq ft building is expected by November with production starting shortly thereafter. The new plant, as well as the yarn spinning plant, will be under the supervision of vice president **John D. Green**.

### **WYATT'S PLASTICS EXPANDS WITH NEW TEXAS PLANT**

One of the largest hydraulic presses for rubber and plastic moldings service in the Southwest was recently set up in the new Wallis, Texas plant of **Wyatt's Plastics, Inc.**

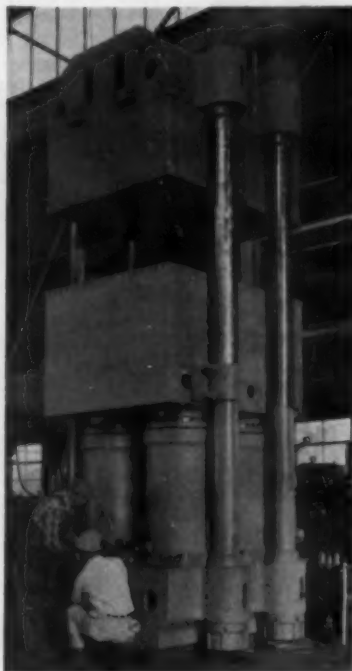
The 1,200 ton press has a 5 x 7 ft platen area and 86-in. of available space for molds.

The Wallis, Texas plant, about 37 miles west of Houston, was added to the facilities of the Houston firm last year. The main plant is at 5928 Katy St., Houston, headquarters of this subsidiary of Wyatt Metal & Boiler Works.

The major share of activity at the Wallis plant will be in custom molding rubber products and in the manufacture of rubber sheet stock.

Wyatt's Plastics, Inc., now in its third year of operation, has both compounding, molding, and fabrication facilities for plastic and rubber parts as well as warehouse facilities for plastic piping and fittings. The fabrication shop is equipped for lining tanks and other vessels for the refining chemical and process industries.

**Carl J. Eckenrod** is vice president and plant manager. Wyatt's sales ac-



tivity is under the direction of **R. L. Jarmon, Jr.** who was in the sales department of Wyatt Metal & Boiler Works prior to becoming vice president of Wyatt's Plastics, Inc.

### **PULPWOOD — 56% Consumption in South**

Pulp mills in the South last year consumed nearly 20 million cords of pulpwood in the manufacture of paper and its products, which is now running around 24 billion pounds annually in the region, according to the Atlanta field office of the U. S. Department of Commerce.

Of the 19,875,723 cords of pulpwood consumed in the 16-state region and District of Columbia making up the broad South in the production of woodpulp for paper purposes, 12,045,717 went into consumption in plants located in Florida, Georgia, the Carolinas and Virginia, Maryland, Delaware and the District of Columbia, and the remaining 7,830,006 cords were consumed in Alabama, Mississippi, Tennessee, Kentucky, Arkansas, Louisiana, Oklahoma and Texas.

Total consumption in the South in 1957 represented about 56% of the 35,489,966 cords consumed in the nation as a whole in paper and board production. All of the other regions were far outstripped by the South in pulpwood consumption last year.

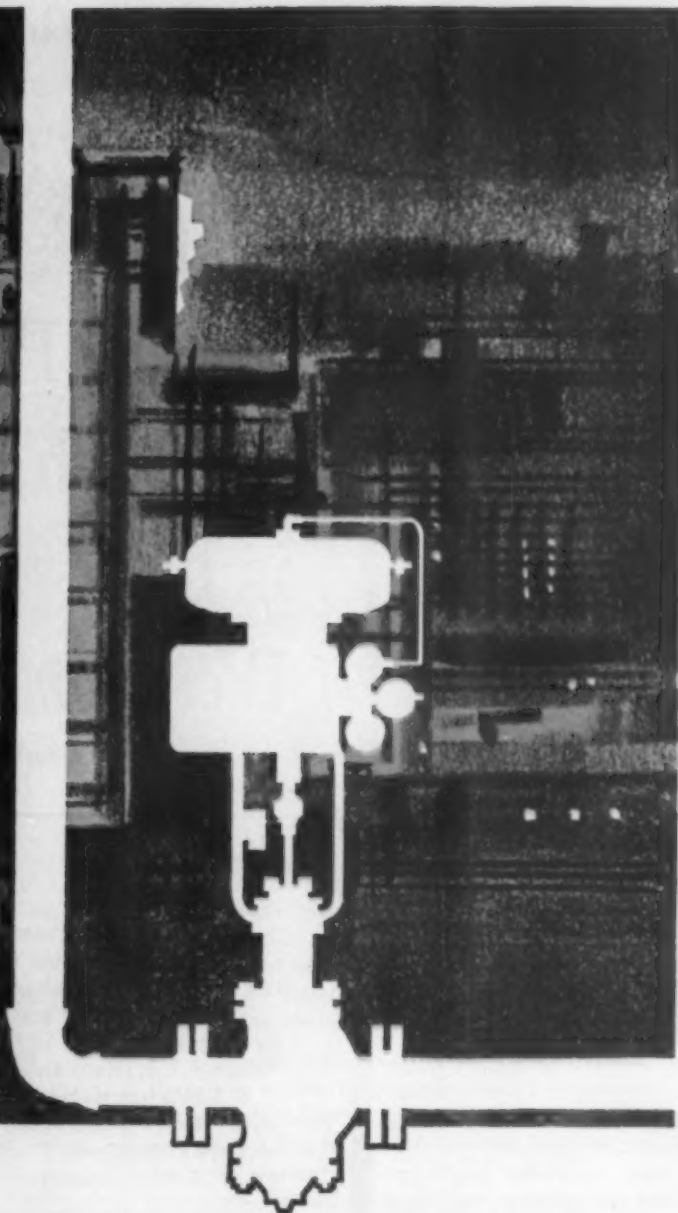
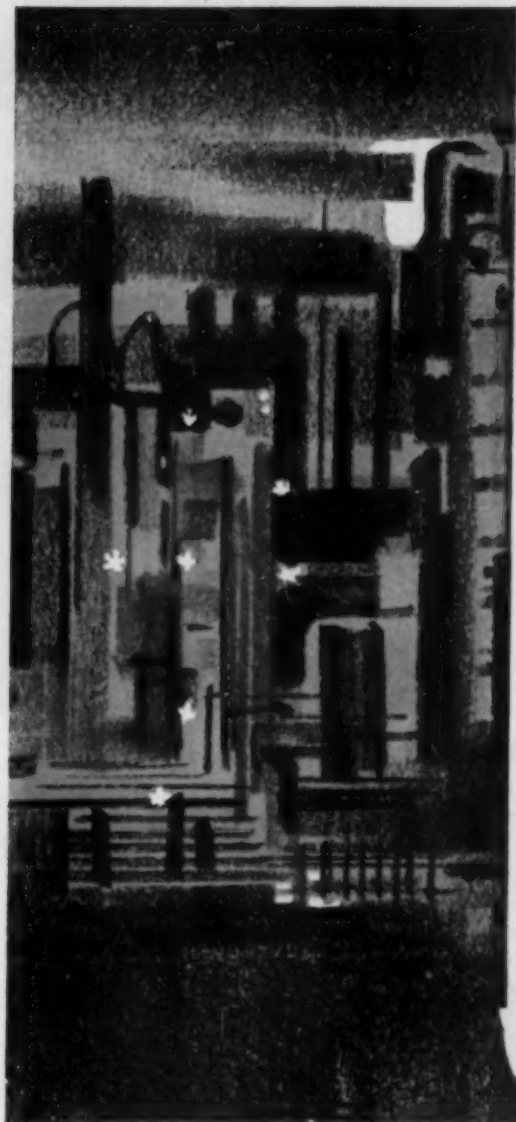
### **New Pipe Mills for Florida's Roll-Weld**

**Roll-Weld Pipe and Tube, Inc.**, of Jacksonville, Florida (formerly the Aluminum Tubing Company) is now operating two new pipe mills. Steel and stainless steel as well as aluminum pipe and tubing are being produced in outside diameters ranging from ½" through 14" in wall thicknesses from .028" through 250-in.

Roll-Weld Pipe and Tube produces steel pipe for oil and gas gathering, transmission and distribution lines, water and oil well casing, municipal and project water systems and construction pipe. Aluminum pipe is manufactured for the irrigation and outdoor furniture industries and stainless steel pipe and tubing for the chemical process and related industries.

**Jack Neupert** is president and **Howard McCarl** general manager.





**...almost forgotten...because it does its job so well!**

Dependable, year-after-year performance makes a Fisher Diaphragm Motor Valve the preferred control in the power and process industries. The Fisher D.M.V. has features not available on other brands. The extra thick steel casing, the precision finished valve stem, the large capacity and the trouble-free operation—these are just a few of the reasons a Fisher gets the nod when it comes to diaphragm motor valve selection.



IF IT FLOWS THROUGH PIPE ANYWHERE IN THE WORLD... CHANCES ARE IT'S CONTROLLED BY...

**FISHER GOVERNOR COMPANY**

Marshalltown, Iowa / Woodstock, Ontario / London, England

If you want to know more about the ultimate in control—the Fisher Diaphragm Motor Valve—write for Bulletin E657A.

**FISHER®**  
*Controls*

SINCE 1880

**For The Second Consecutive Year...**

# In *Every One* of the Nation's "Top Six" Steam Power Plants, Fly Ash Control is by *Western Precipitation!*



As power plant executives know, each year the Federal Power Commission "rates" the nation's major steam power plants to determine their overall efficiency as determined by their heat rate.

According to the latest Federal Power Report, the "Top Six" steam power plants are... 1. Tanners Creek Plant (Indiana and Michigan Electric)... 2. Kanawha River Plant (Appalachian Electric Power)... 3. A two-way tie between Muskingum River Plant (Ohio Power) and Kyger Creek Plant (Ohio Valley Electric)... and 5. A two-way tie between Clifty Creek Plant (Indiana-Kentucky Electric) and St. Clair Plant (Detroit Edison).

Obviously, to qualify among the nation's best, these plants represent not only advanced engineering design but also the most painstaking evaluation and selection of equipment. *And we at Western Precipitation take particular pride in the fact that—for the second straight year—the equipment selected for fly ash control in EVERY ONE of the top six plants is Western Precipitation equipment!*

Could there be any greater testimony to the outstanding quality and unsurpassed efficiency of Western Precipitation fly ash control equipment?



COTTRELL Electrical Precipitators  
MULTICLONE Mechanical Collectors  
CMP Combination Units  
DUALAIR Jet-Cleaned Filters  
HOLO-FLITE Processors  
HI-TURBIANT Heaters

## **WESTERN PRECIPITATION CORPORATION**

Engineers and Constructors of Equipment for Collection of Suspended Material from Gases . . . and Equipment for the Process Industries  
LOS ANGELES 54 • NEW YORK 17 • CHICAGO 2 • PITTSBURGH 22 • ATLANTA 5 • SAN FRANCISCO 4  
*Representatives in all principal cities*

Precipitation Company of Canada Ltd., Dominion Square Bldg., Montreal

# World's First Nuclear-Powered Surface Ship will have **MIDWEST** Welding Elbows



U. S. Navy's guided missile, nuclear-powered cruiser "Long Beach"

OFFICIAL U. S. NAVY PHOTOGRAPH

## Special Fittings are "ROUTINE" for Midwest



Stainless Steel  
S.R. 102° Elbow  
with tangent on one end.



Stainless Steel  
S.R. 90° Elbow  
with tangent on both ends.



Stainless Clad  
S.R. 39° Elbow  
with tangent on one end.

Special Elbows (dimensions, tangents, wall thicknesses and materials) are easily provided by the exclusive and flexible Midwest method. Elbows are available in any material that can be secured as plate, which also means better delivery. Closer tolerances are inherent in the Midwest process. Quality control always exceeds Code requirements.

Shown here are three of the special stainless steel and stainless-clad elbows made by Midwest for the "U.S.S. Long Beach". All reactor coolant piping must meet extremely rigid specifications because of the difficult service. Special quality controls, such as ultrasonic testing, intergranular corrosion tests, dye checking, radiography, and ring flattening tests were used one or more times at various stages of manufacture from the raw material to the finished fittings. Special quality standards for soundness of metal, "water clear" welds, dimensional accuracy, and surface finish were satisfied.

The U. S. Navy's first nuclear-powered surface ship, the "Long Beach", will introduce a radically new concept in defense capabilities. She will operate offensively and independently of other forces under conditions of both nuclear and non-nuclear warfare against airborne, surface or under-sea opposition. In addition to equipment and weapons for detecting and destroying enemy submarines, she will carry the Navy's modern guided missiles.

The piping for the atomic reactors being designed and developed by the Westinghouse Electric Corporation will use a large number of special heavy wall stainless steel Midwest Welding Elbows. This is not the first atomic project for which Midwest Welding Fittings have been used. In fact, when the nuclear propulsion program first began, Midwest furnished special welding fittings for the "Nautilus" prototype installation at Arco, Idaho.

Whether or not you are concerned with nuclear power, Midwest Welding Fittings (both stock and specials) will do a better job for you. Ask your Midwest distributor or write us for Catalog 54, which tells you why.

## MIDWEST PIPING COMPANY, INC.

Main Office: St. Louis 3, Missouri (P.O. Box 433)

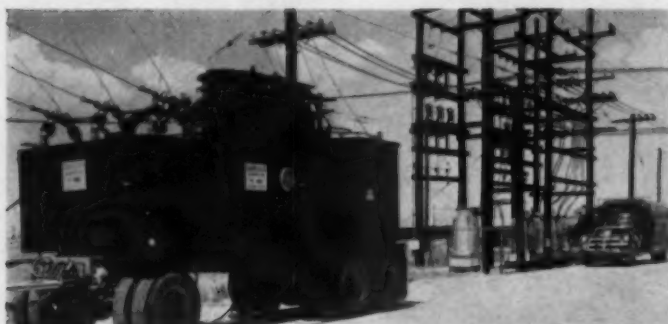
Plant: St. Louis, Clinton, N. J. and Los Angeles

SALES OFFICES: ASHEVILLE (BOX 446, SKYLAND, N.C.) • BOSTON 27—426 FIRST ST.  
CHICAGO 3—79 WEST MONROE ST. • CLEVELAND 14—616 ST. CLAIR AVE.  
HOUSTON 2—1213 CAPITOL AVE. • LOS ANGELES 33—320 ANDERSON ST.  
MIAMI 34—2103 LE JEUNE RD. • NEW YORK 7—50 CHURCH ST.  
PITTSBURGH 19, PA.—437 GRANT ST. • ST. LOUIS 4—1450 S. SECOND ST.  
SAN FRANCISCO 11—420 MARKET ST.

STOCKING DISTRIBUTORS IN PRINCIPAL CITIES

# MIDWEST

WELDING FITTINGS IMPROVE PIPING DESIGN AND REDUCE COSTS



## **Portable Sub Maintains Service**

**AT GULF OIL's** giant Port Arthur, Texas refinery, this General Electric mobile unit substation takes over while permanent substation (background) is off the line for inspection and maintenance. Mobile sub has a three-winding transformer, can be hooked up five different ways to replace substations or transformers ranging up to 3,000 kva.

The huge refinery generates its own electricity and operates its own transmission and distribution system. It has three power plants with a total capacity of about 70,000 kw, and more than 140 transformer banks or substations, ranging from 5,000 kva downward.

## **Oil Terminal — N. C.**

Over 4 million gallon storage facilities, modern office and warehouse building and truck loading racks are being constructed by **Republic Oil Refining Company** (Div. of Plymouth Oil Company) on a 12-acre tract northwest of Charlotte, N. C. Republic's petroleum products are manufactured in Texas City, Texas. Home offices are in Pittsburgh.

## **Anheuser-Busch Plant Mgr. — Tampa, Fla.**

**Kenneth H. Bitting, Jr.**, now assistant plant manager of the Los Angeles brewery of Anheuser-Busch, will be plant manager of the company's new brewery now under construction in Tampa, Florida. Appointment is effective in July. He is now developing operating plans and procedures, selecting personnel and requisitioning operating supplies and equipment.

## **Operations Expanded by Florida Packaging Firm**

A 150,000 sq ft expansion of **Central States Paper & Bag Co.'s** plant at Palatka, Florida is the second increase in plant capacity since operations began in 1954. The company started with a 40,000 sq ft building which was doubled in size in 1955. **Edward Kurtzborn, Jr.** is Plant Manager.

Central States manufactures a wide range of bags for industrial and consumer products, ranging from bags a few inches in size to liners large enough for a freight car. **Herbert L. Abramson** is vice president in charge of Florida sales.

## **G-E Service Shop Opens in Miami**

General Electric's 52nd Apparatus Service Shop, established in Miami is now providing maintenance and repair service to industry and businesses in Southeastern Florida.

## **Goodyear Starts \$9 Million Plastics Plant in W. Va.**

**Goodyear Tire & Rubber Co.** is expecting full production by early spring of 1959 for its \$9,000,000 plastics plant located on a 300 acre tract in **Apple Grove, W. Va.**

The five-story structure, containing 100,000 sq ft, will manufacture **Videne**, a polyester laminating film that can be adhered under heat and pressure to textiles, metals, wood, paper and certain plastics without adhesives and which will vacuum form or draw to the limits of supporting materials. The product can also be used as a special wrap for machine packaging of meat and other food products.

## **Florida Site Purchased by Pharmaceutical Mfrg.**

Although there are no immediate plans for plant construction, **Schering Corporation**, major pharmaceutical manufacturer of Bloomfield, New Jersey has purchased 531 acres in Hillsborough County, Florida, 11 miles north of Bradenton and 23 miles south of Tampa. Plans are being developed for its use but in the meantime a number of other Company building projects take precedence.

## **New Cambar Branch for Savannah, Ga.**

**The Cameron & Barkley Co.**, a leading Southeastern distributor of industrial supplies and machine tools, has purchased a site on the Augusta Road in Savannah for a new branch operation and warehouse. Plans are also nearing completion for a similar expansion in Charleston, S. C. and Jacksonville and Tampa, Florida, with new branches in Cocoa Beach and Mulberry, Fla. Cambar headquarters are in Jacksonville.

**More Plants—Page 28**





## Things hop when you place a metals order at Reynolds Aluminum Supply Company

Reynolds Aluminum Supply Company's fast and efficient handling of your industrial metals requirements is unmatched. Production delays need never happen in your plant. Your metals order, large or small, will be rushed from order desk to loading platform in a matter of hours at any one of the nine metals warehouse facilities.

Ten acres of warehouse area from the Atlantic to the Mississippi, Ohio to the Gulf are devoted to the servicing of the needs of industrial concerns throughout the South. Reynolds Alum-

inum Supply Company's metals warehousing facilities are located in major industrial markets serving eleven Southern states.

Whether your needs are in the form of metals, or slitting, shearing, sawing, decoiling, roll forming, or corrugating, a one-stop Reynolds Aluminum Supply Company warehouse can fill your order accurately and make delivery on time.

If you want to see the fur really fly, phone the nearest warehouse for your requirements in aluminum, steel, copper, or stainless steel today!

### ALUMINUM MILL PRODUCTS

- sheet • plate • coil • fasteners
- extruded architectural shapes
- screw machine stock
- structural angles and channels
- rods • bars • tubing • pipe
- cast aluminum tooling plate
- aluminum tread plate
- gas and instrumentation tubing

### STEEL FLAT SHEETS

- galvanized • cold rolled
- hot rolled • paint grip

### COPPER SHEETS & FLASHING

- soft • cold rolled

### SERVING WHEREVER YOU ARE IN THE SOUTH

#### INDUSTRIAL BUILDING PRODUCTS

- heavy gauge aluminum and steel roofing and siding & accessories
- fiberglass panes and panels
- seamless terne roofing
- glass fiber industrial insulation
- aluminum and galvanized nails
- plywood • asphalt products

#### STAINLESS STEEL

- sheet • plate • strip
- rod • bar • angle
- pipe • tube • fittings

REYNOLDS  
ALUMINUM  
SUPPLY CO.

Serving Southern States



Ind. Supply Company

Our 44th Year

GENERAL OFFICE—ATLANTA, GEORGIA

Atlanta, Georgia

Miami, Florida

Birmingham, Alabama

Nashville, Tennessee

Louisville, Kentucky

Raleigh, North Carolina

Memphis, Tennessee

Richmond, Virginia

Savannah, Georgia

# introducing **GULF**



After 2 years exposure, Gulf Metalcoat A is still giving exceptional protection to the structural steelwork supporting this 40-ton overhead traveling crane.

# METALCOAT A

the revolutionary new  
aluminum pigmented liquid coating that:

- protects metal surfaces against rust and corrosion up to 10 times longer
- protects under the most severe exposures in marine and industrial atmospheres
- is easy to apply by brushing, dipping or spraying—to either rough or polished surfaces
- is unaffected by temperature changes
- resists the abrasion of normal handling—yet can be easily removed by a petroleum solvent such as Gulf Stoddard Solvent
- costs less

New Gulf Metalcoat A has been passing the most rugged marine and industrial tests for 9 years! Salt spray tests at Wrightsville Beach, N.C., revealed that Gulf Metalcoat A gave from 7 to 10 times greater protection than that afforded by competitive products. In Philadelphia, overhead cranes in a shipyard have been perfectly protected by Gulf Metalcoat A for 4 years. Ships have used the new coating on stacks exposed to salt spray atmosphere—with outstanding success!

For longer-lasting protection, use new Gulf Metalcoat A on piping, fences, storage tanks, machine parts, transportation and marine equipment, ships, barges,

metal roofs, stacks, sheet metal buildings. For temporary protection, Gulf Metalcoat A is excellent for structurals and steel components of all kinds which must be protected during storage or shipment.

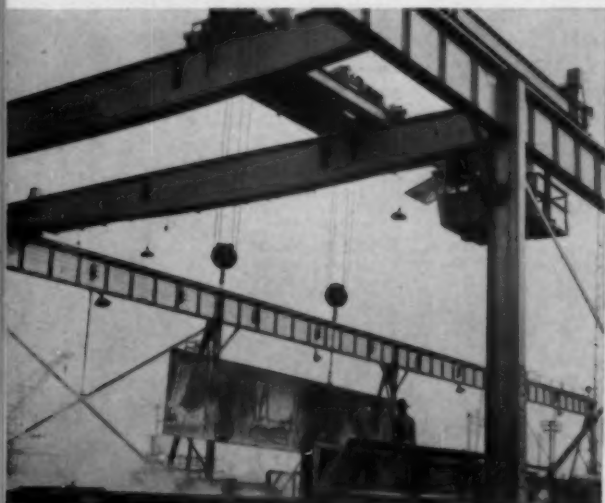
Get complete details on new Gulf Metalcoat A by calling your nearest Gulf office. It's available now!



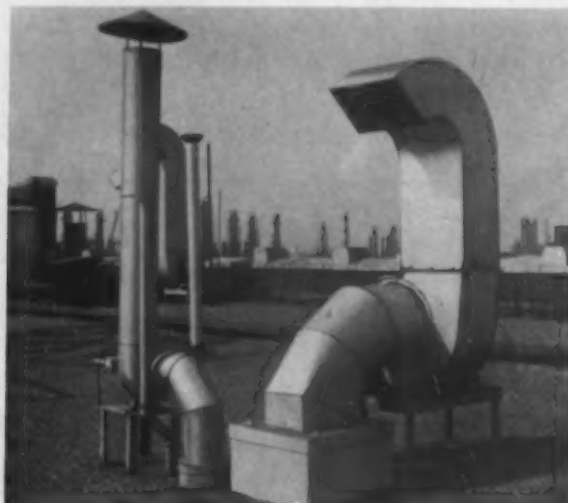
## GULF OIL CORPORATION

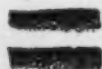
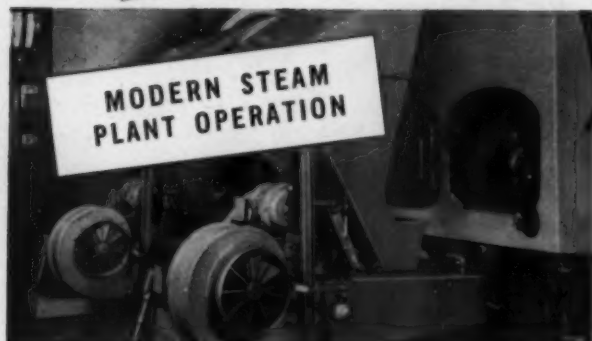
Dept. DM, Gulf Building  
Pittsburgh 30, Pa.

Gulf Metalcoat A has protected this steelwork for 4 years—above sulfuric acid pickling tanks! The coating is still in excellent condition.



These building exhaust ventilators, located in an extremely corrosive atmosphere, are kept free from rust and corrosion by Gulf Metalcoat A.





**LOW COST STEAM  
GENERATION**

*They all  
add up!*

The world's finest all-purpose Bituminous Coal comes from mines located along the Norfolk and Western. This coal is mined by the most modern methods and is virtually "tailored" in modern preparation plants to meet the varying needs of industry.

The sum of these advantages, plus dependable N&W transportation and your own modern steam operation, equals what every economy-minded coal user strives for — low cost steam generation!

N & W coal bureaus where competent coal counseling service is available without obligation:

**ROANOKE**

N&W Coal Traffic Dept.  
Telephone Diamond 4-1451,  
Ext. 313, 423, 249, 732  
Roanoke, Virginia

**BOSTON**

833 Chamber of Commerce Building  
Telephone Liberty 2-2229  
Boston 10, Massachusetts

**CHICAGO**

Room 604,  
206 South LaSalle Street  
Telephone RAndolph 6-4634  
Chicago 4, Illinois

**CINCINNATI**

913 Dixie Terminal Building  
Telephone DUnbar 1-1325  
Cincinnati 2, Ohio

**CLEVELAND**

Room 722  
The Illuminating Building  
Telephone MAin 1-7960  
Cleveland 13, Ohio

**DETROIT**

1907 Book Building  
Telephone WOrdward 1-2340 or  
1-2341  
Detroit 26, Michigan

**ST. LOUIS**

2059 Railway Exchange Bldg.  
Telephone MAin 1-1180  
St. Louis 1, Missouri

**WINSTON-SALEM**

1105 Reynolds Building  
Telephone PArk 2-7116  
Winston-Salem 1, North Carolina

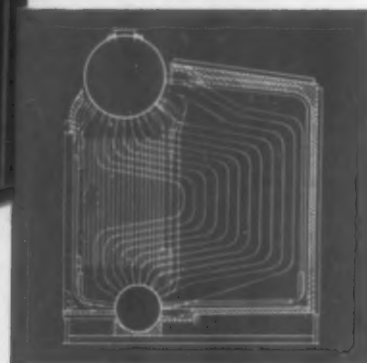
**Norfolk and Western  
RAILWAY**

CARRIER OF FUEL SATISFACTION



# HIGH CAPACITY PACKAGED STEAM GENERATORS

## by Foster Wheeler



### Series AG-200 extends economy and dependability of FW Packaged Design to over 60,000 lb/hr

To meet the needs of industrial plants for high-capacity Packaged Steam Generators, Foster Wheeler offers units for capacities of 50,000 to 63,000 lb/hr and higher, depending on operating conditions.

A modification of the proven AG-100 design which has provided industry with reliable, economical

steam in the range of 10,000 to 50,000 lb/hr, these compact, space-saving units permit more steam capacity in less space than has heretofore been possible. For complete details, write to *Foster Wheeler Corporation, 666 Fifth Avenue, New York 19, N. Y.*

#### FEATURES:

- Final Steam Temperatures to 840 F
- Design Pressures to 900 psig
- Standard Heat Recovery Arrangements Available
- 42-inch Steam Drum
- Two Burners
- Automatic Controls
- Suitable For Indoor or Outdoor Installation
- Tangent Bare Tube Furnace Side Walls and Roof
- Staggered Boiler Bank Tube Arrangement
- Fully Drainable and Removable Superheater.

#### THE FOLLOWING AG-200 UNITS ARE NOW IN PRODUCTION:

Capacity lb/hr	Operating Pressure psig	Final Steam Temperature Deg. F	Feedwater Temperature Deg. F	Fuel	Efficiency	Steam Quality
52,500	400	750	200	No. 6 Oil	85.5	3 ppm Solids Carryover
60,000	285	Set.	220	Nat. Gas	78.3	3 ppm Solids Carryover
63,700	150	Set.	225	No. 6 Oil	83.7	0.5% Moisture Carryover
66,000	620	Set.	350	No. 6 Oil	80.9	1 ppm Solids Carryover

# FOSTER WHEELER

NEW YORK • LONDON • PARIS • ST. CATHARINES, ONT.

# See them Now!

## Industry's MOST WANTED line of GENERAL PURPOSE VALVES

FOR PETROLEUM REFINERIES  
CHEMICAL PLANTS • POWER PLANTS

**Vogt DROP FORGED**

**Vogt GP**

**GENERAL PURPOSE VALVES**

GATE, GLOBE and ANGLE TYPES • Sizes 1/4 thru 2

**Supplement No. 1 To Catalog F-9**

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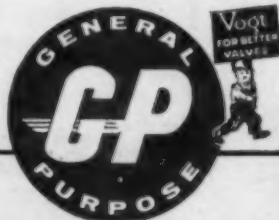
**MOST WANTED** — that's right — because the G P line includes gate, globe, and angle type valves having seats faced with **HAYNES STELLITE\*** alloy or other hard facing alloys for greater seat-wear resistance . . . at no extra cost!

Hard faced seats, in combination with precision finished, selectively hardened discs and wedges give these valves amazing resistance to erosion, corrosion

and galling. That's why they are setting new standards of performance in steam, water, oil, or gas services at the recommended pressures and temperatures.

Get longer, drop-tight, service life with minimum maintenance by specifying Vogt G P Valves. Available in a complete range of sizes from 1/4" to 2" and rated 800 pounds at 850°F. and 2000 pounds at 100°F.

# Vogt

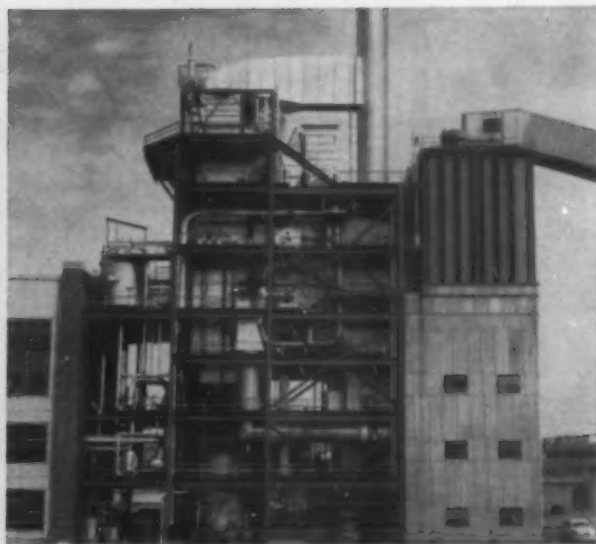
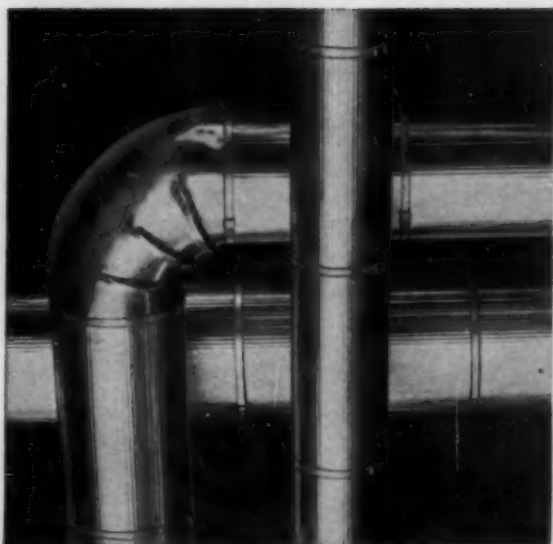


**DROP FORGED STEEL  
VALVES**

**HENRY VOGT MACHINE CO.**  
P. O. Box 1918 — Louisville 1, Ky.

**SALES OFFICES:** New York, Chicago, Cleveland, Dallas, Philadelphia, St. Louis, Charleston, W. Va., Cincinnati.

\*Trade-Mark of Union Carbide and Carbon Corporation



## Childers Jacketing Protects Insulated Lines, Decreases Heat Loss, Improves Appearance:

Maintenance-free Childers Jacketing goes on fast and easy . . . never needs painting . . . gives steam lines the well-dressed look that good housekeeping demands.

**Insulation lasts far longer**, say leading power plant engineers, when protected with Childers Aluminum Jacketing. Costly maintenance and repairs to insulation are reduced, and insulation is protected against damage from workmen, moving equipment and dripping fluids like oil and grease.

**Heat lost by radiation is reduced**, too, when Childers Jacketing is installed on power plant lines and equipment. The improved efficiency of the insulation decreases fuel consumption. Fewer BTU's are lost per KWH.

**Tight, positive protection** and weatherproofing of insulation is assured by exclusive Childers Lap-Seal (patents pending). This feature takes the guess-work out of jacketing laps—speeds installation, saves labor while giving a superior seal.

**Greater strength at less cost** is yours with Childers Cross-Crimp®. Tests prove the rolled-in 3/16" cross corrugation increases the vertical strength and rigidity of .016" thick aluminum to that of plain .024" thick aluminum. Jacketing costs are consequently reduced as much as 1/3 when Childers Jacketing is used instead of ordinary sheet aluminum.

**You can complete the installation** of neat, maintenance-free aluminum over every square foot of valuable

insulation by using new Childers Ell-Jacs. These two-piece aluminum covers are available for insulated elbows up to 16" o.d., including insulation thickness. For larger elbows, regular roll jacketing is easily mitered on the job and applied.

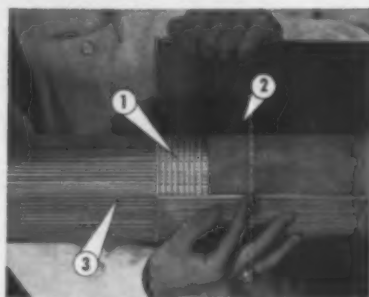
**First cost is less** for Childers Jacketing and Ell-Jacs than for any other permanent-type protection—even less than some temporary coverings which require constant maintenance, repair and replacement.

**Installation is easy.** Two men can do the job. Best method of attaching jacketing is with aluminum strapping and seals. Only pliers and screwdriver are needed. Childers Ell-Jacs are applied with aluminum sheet metal screws. Jacketing and Ell-Jacs can be removed to inspect lines, then reapplied without waste.

**Engineering Representatives in 27 cities** provide technical information and assistance on protection of insulated lines, elbows, towers, vessels, tanks. Only Childers has this nationwide service organization.

**For a free sample** of Childers Jacketing, with engineering data on how to safeguard your insulation, write to: Childers Manufacturing Co., P. O. Box 7467, Dept. SPI-12, Houston 8, Texas.

In Canada, write direct to Peerless Mfg. Co., Sub-Post Office 28, Calgary, Alberta.



### CHILDERS FEATURES CUT COSTS:

(1) Exclusive LAP-SEAL, available at no extra cost, is a series of 8 ribs rolled into the underlapping edge of jacketing, providing automatic measure of the 2" circumferential lap.

(2) FACTORY-ATTACHED MOISTURE BARRIER protects the underside of the aluminum from possible attack by alkaline solutions present in many insulating materials, eliminates the need of applying a separate moisture barrier.

(3) CROSS-CRIMP increases strength of jacketing, cuts material cost.

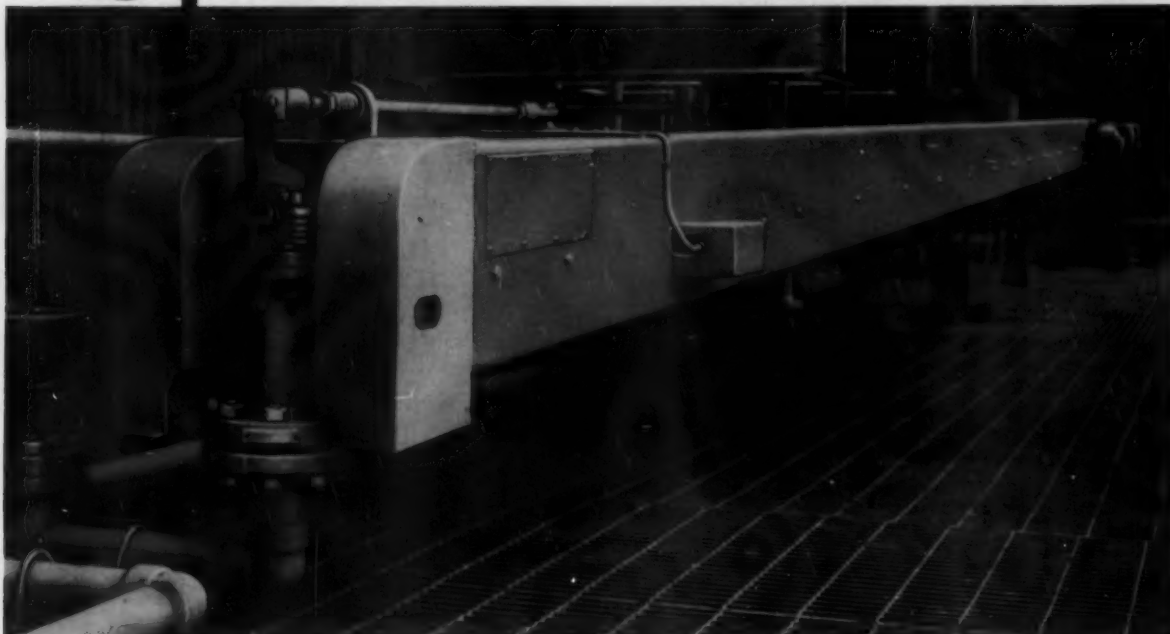


**HEAVY WEIGHT** Childers aluminum jacketing is recommended for extra protection of lines along walkways and other areas subject to physical abuse. Also recommended for protection of insulated towers, vessels, and tanks. Comes in labor-saving 4' wide rolls.

Only Childers makes available to you complete specifications and engineering data on aluminum jacketing in these catalogs: Sweet's Industrial Construction File pp. 6b/Ch; Chemical Engineering Catalog pp. 530a-d; Refinery Catalog pp. 341-4.



*How Copes-Vulcan control systems boost power plant efficiency*



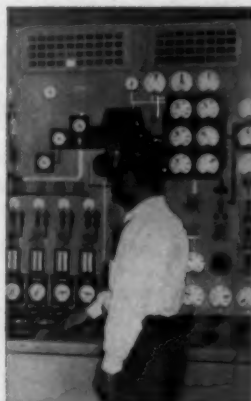
38-foot travel with this Vulcan T-30 on a 1400-psig utility boiler. Write for Reprint 1040, the story of this interesting installation.

## **Vulcan soot blowers clean widest furnaces ...simplify maintenance**

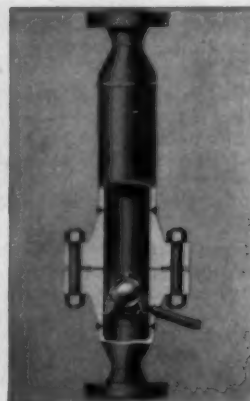
Vulcan long retractable soot blowers are products of years of experience in the utility field. A dual-motor drive permits one motor to extend and retract the lance, another to rotate it. This provides an infinite number of multi-helix jet patterns for *complete* coverage, *uniform* cleaning.

Built to withstand outdoor installations in all climates, these soot blowers feature simplicity of working parts to assure dependable operation with a minimum of outages for servicing.

**One source . . . one responsibility . . . a complete service.** Besides boiler cleaning equipment, Copes-Vulcan builds complete control systems for combustion, feed water, superheat and reheat temperatures, feed water bypass, pressure reducing and desuperheating. Whether furnished separately or integrated into a single package, each installation is custom-designed for the specified conditions. Write for Bulletin 1022-B.



**Combustion control for every need.** Copes-Vulcan combustion control adapts to all generating capacities, load ranges, pressures and fuels. Write for Bulletin 1032, the story of a utility installation featuring compact panel with miniature instruments.



**Desuperheater improves temperature control.** New Copes-Vulcan Variable-Orifice Desuperheater holds reduced steam temperature constant only twenty feet downstream from desuperheater outlet, even over a 50-to-1 load range. Write for Bulletin 1037.

**Copes-Vulcan Division**  
**BLAW-KNOX COMPANY**  
Erie 4, Pennsylvania



# POWELL

world's largest family of valves

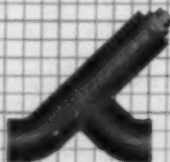


Fig. 1365A - Small Steel Pressure Seal 1 1/2" Check Valve for 1500 pounds W.S.P. Socket weld ends. Sizes 1/2" to 2". Also available for 2500 pounds in sizes 1/2" to 3".

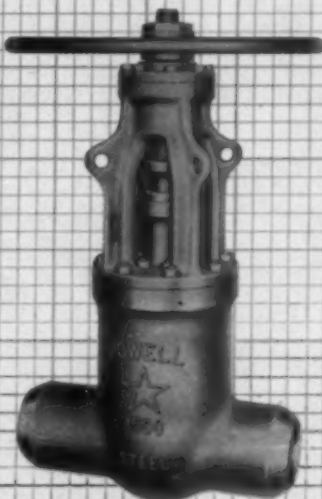


Fig. 14303 - Steel Pressure Seal Gate Valve for 1500 pounds W.S.P. The higher the pressure within the valve the tighter the seal at body-bonnet joint. 600, 900, 2500 pound valves can be furnished.



Fig. 3061A WE - Newly designed Steel Swing Check Valve for 300 pounds W.S.P. Has straight flow through area when disc is in wide open position.

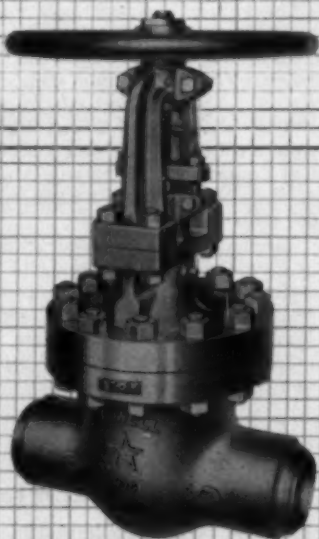


Fig. 9003 WE - Steel Gate Valve for 900 pounds W.S.P. Outside screw rising stem and yoke. Solid wedge disc. Steel valves are available for pressures from 150 through 2500 pounds.



Fig. 512 - Small Bronze Gate Valve for 150 pounds W.S.P. Inside screw non-rising stem. Solid wedge disc. Can also be supplied with flanged ends.



Fig. 1444 - Large Iron Body Bronze Mounted Gate Valve for 125 pounds W.S.P. Outside screw rising stem and yoke, double wedge disc. Also available with solid wedge disc.

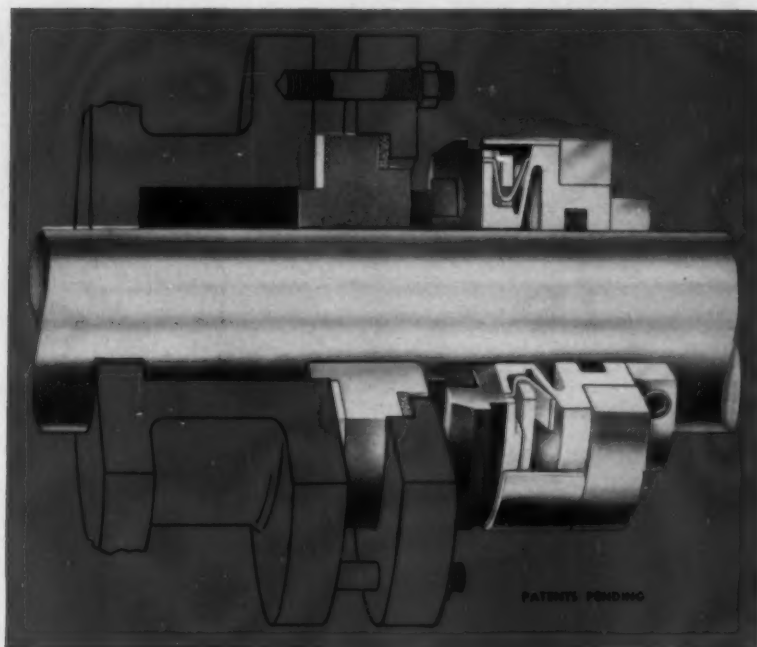
**NO MATTER WHAT** your flow control requirements, Powell offers more kinds or types of valves, available in the largest variety of metals and alloys. Powell distributors, located in all principal cities, maintain inventories to fill almost any need. For special engineering problems, write direct to:

**THE WM. POWELL COMPANY • Dependable Valves Since 1846 • Cincinnati 22, Ohio**

# BELMONT

## "Chemical" SEAL

(PRESSURE BALANCED TEFLON BELLOWS DESIGN)



- Greatest immunity to corrosion
- Longest useful life
- More economical than any other design or materials combination

Customers report unsurpassed performance in difficult corrosive service with the BELMONT Chemical SEAL. A rotating mechanical seal, it employs a pressure balanced TEFLON\* bellows design, free from the weaknesses (corrosion and flexural fatigue) of conventional metallic bellows.

Rotating with the shaft, only bearing surface is between rotating and stationary seal faces. No scoring of shafts. Will work satisfactorily on shafts previously scored by other seals or conventional packing.

Provides a perfect fluid seal without high friction load on the shaft and attendant high power costs. Greatly reduces hazards of handling flammable, explosive, corrosive and toxic liquids, and will handle abrasive slurries (when proper flushing means are provided). For pressures at the seal up to 100 psi at 75° C. Temperatures to 100° C at 75 psi. Standard sizes to fit shafts from 1/8" to 2 1/4".

Ask Your Belmont Distributor or write for Catalog T-57.

The Belmont Packing and Rubber Company  
Butler & Sepviva Streets, Phila. 37, Pa.

\* du Pont Trademark

# BELMONT

## News Briefs (Continued)

### Hardboard Mill for Catawba, S. C.

A new hardboard mill is being constructed at Catawba, South Carolina for **Bowater Board Company**, a division of Bowaters Southern Paper Corporation. Product will be Bowater Board, manufactured solely from hardwood trees.

General contractor is the Daniel Construction Company of Greenville, S. C. Construction schedule is being co-ordinated with that of a pulp mill now being erected at Catawba by Bowaters Carolina Corporation. Certain services, such as steam, power and wood handling, will be provided by the pulp mill.

### \$3 Million Gas Plant — Louisiana

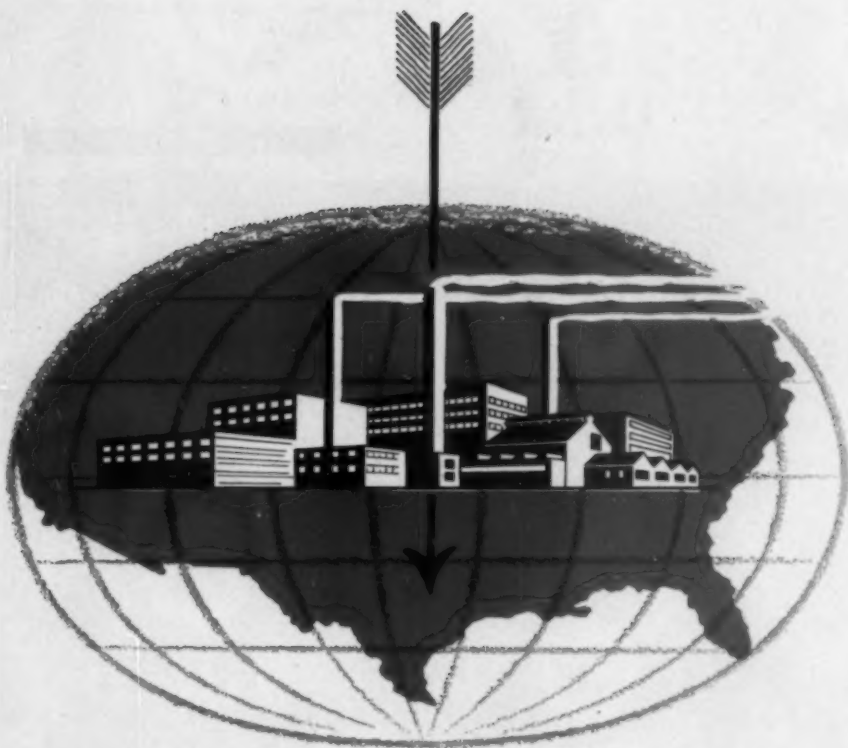
The Fluor Corporation's Houston's office has been awarded a contract to design, engineer, and construct a 150 million cubic-feet-per-day gas processing facility to be jointly owned by **Texas Natural Gasoline Corporation** and **Tennessee Gas Transmission Company**. Amount of the contract is in excess of \$3,000,000.

Located about 15 miles southeast of New Orleans, Louisiana, the new installation will extract propane from a natural gas feed. Construction is scheduled to begin this month with completion set for November, 1958.

### Prestressed Concrete Plant for Arkansas

With operation scheduled for late April, **Arkansas Steel and Prestressed Concrete Corporation's** ultra-modern plant near **Rose City, Arkansas** will soon be producing 2,400 sq ft of building area per day. Capacity operation will step up to 21,000 sq ft per day upon completion.

Hugh J. Taylor is president and William T. McNutt, vice president of the company producing long span structural members, bridge beams and piling, electrical transmission poles, etc.



## Take a Good Look at the . . . Changing Industrial Face of the South

Metalworking is on the move throughout the South and nowhere is industrial change more apparent than in the Southwest, scene of the first great Southwestern Metal Congress and Exposition.

208 outstanding firms will recognize this vital industrial development by exhibiting in the Southwestern Metal Exposition in Dallas, May 12-16. Operating exhibits in big, beautiful and convenient State Fair Park will bring metal experts to you, to discuss *your* problems.

Daily technical and practical programs during the concurrent Southwestern Metal Congress will present scientists and engineers in panel discussions of (1) High Strength Steels for Aircraft; (2) Sheet Materials for High Temperature Service; (3) New Fabrication Techniques; (4) Corrosion in the Petroleum and Chemical Industries.

This is THE event you will want to attend. Plan NOW to be in Dallas . . . make hotel reservations at the Adolphus, the Baker or the Statler-Hilton.

**STATE FAIR  
PARK**

**DALLAS, TEXAS**

**MAY 12-16,  
1958**

**Southwestern Congress and  
Exposition**

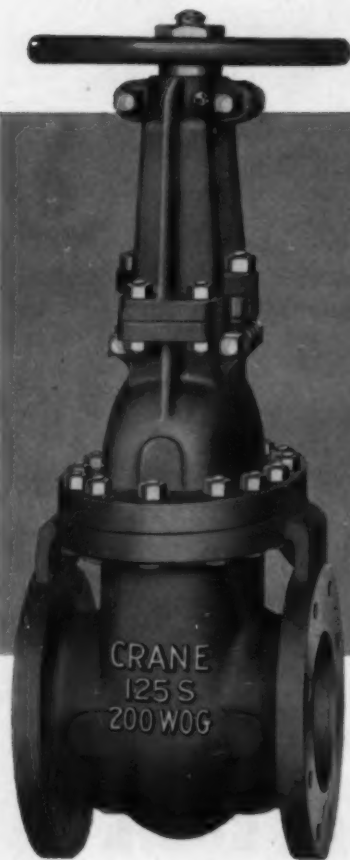
W. H. EISENMAN, *Managing Director*

CHESTER L. WELLS, *Assistant Director*

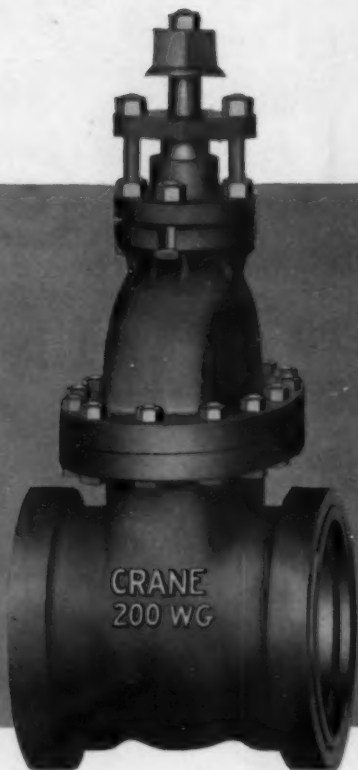
7301 EUCLID AVENUE • CLEVELAND 3, OHIO



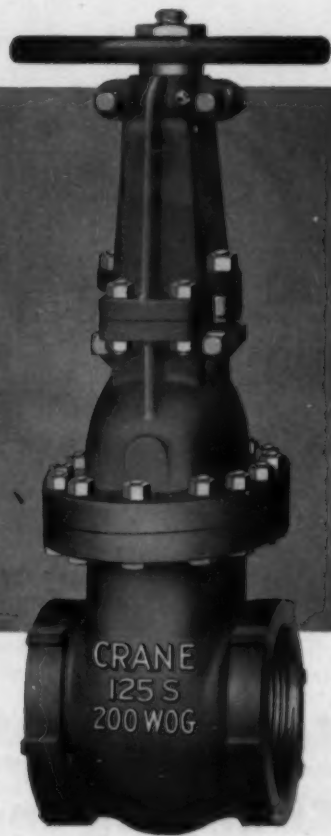
Flanged end; outside screw and yoke.  
Available with brass seat and steel  
stem; brass seat and brass stem; or  
in all-iron.



Screwed end; outside screw and yoke.  
Available with brass seat and steel  
stem; brass seat and brass stem; or  
in all-iron.



Hub end; non-rising stem;  
brass seat and stem.



## Crane Iron Body Gates—Versatile Valves for Power and Process Piping

Look to Crane for better performing 125-pound iron body wedge gate valves. Improved design gives them greater strength and important operational advantages. As a result, these valves offer dependable performance on a wide variety of services . . . easy maintenance . . . long life.

Among the advantages of Crane iron body wedge gates are:

- *Oval body and bonnet*, with extra metal where needed most.
- *No bonnet joint leakage*—More bonnet bolts on closer centers insure uniform bolt load distribution on bonnet joint and gasket.
- *Long disc guides* seat discs properly . . . minimize drag

on seating surfaces . . . prolong valve life.

- *Shoulder-type seat rings* prevent rings from loosening in service.
- *Two-piece ball-type gland* prevents binding on stem even when gland bolt nuts are pulled up unevenly.
- *Exceptionally deep stuffing box* can easily be repacked under pressure when valves are wide open.
- *Available in 19 sizes*—2 inches to 48 inches—all-iron or brass trimmed. In addition, Crane makes companion valves in globe, angle, check, quick-opening and Underwriters' patterns.

For complete descriptions of Crane iron body gate valves, consult your Crane Representative, or write to Crane Co. at the address shown below.

# CRANE VALVES & FITTINGS

PIPE • PLUMBING • KITCHENS • HEATING • AIR CONDITIONING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas





WHAT'S  
SPECIAL  
ABOUT  
LJUNGSTROM'S®

## **easy maintenance features**

Ljungstrom maintenance is fast and easy because it, too, is a "designed-in" function of the preheater. Necessary work has been foreseen by such money-saving features as:

- Self-cleaning action that loosens deposits by expansion and contraction—coupled with high-velocity soot blowers for daily in-operation purging.
- Cold-end heating elements are factory packed—can be easily replaced, or reversed when one edge starts to thin...which is vital for cold end service and essentially doubles surface life.
- Large inspection port and vapor-proof light to permit observation of heating-surface, even during operation.
- Trained service engineers make periodic visits and are available on short notice for special problems.

That's why seven out of ten installations are Ljungstrom. For the full story write for our 38-page manual.

**The Air Preheater Corporation,** 60 EAST 42ND STREET, NEW YORK 17, N. Y.

# Here's a vertical turbine with **TERRY SOLID WHEEL** and all its advantages



When it comes to judging a turbine's ability to deliver in vertical service, ratings tell only half the story. It's the Terry construction refinements that give you assurance of long-range operational economy: Thrust bearing designed to absorb external pump thrusts ... carbon ring glands specially made for vertical operation ... casings and bearing housings split vertically for easy accessibility.

But most important, the Terry vertical turbine has an *almost* indestructible rotor. A single forging of special composition steel, it has no separate parts to loosen or work out. As the only function of the blades is to form a series of pockets, any wear which might occur would not materially affect horsepower or efficiency.

If your application demands a vertical turbine, specify Terry solid wheel. Available in capacities from 5 to 300 horsepower. And remember, the extra durability built into these vertical turbines is typical of every turbine in the complete Terry line.

For further information, send for a copy of bulletin S-137.

**THE TERRY STEAM TURBINE CO.**  
TERRY SQUARE, HARTFORD 1, CONN.

# TERRY



to serve users of  
structural steel  
**IN THE SOUTH**

Allied Structural Steel  
Companies announces  
a new office at

11 Pryor Street, S. W.  
Fulton-Federal Building  
Suite 618  
**ATLANTA 3, GEORGIA**

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**JAckson 3-7257**



Plants in Chicago, Illinois; Clinton, Iowa;  
Hammond, Indiana; Knoxville, Tennessee  
*Fabricators and Erectors of Structural Steel for  
America's Skyscrapers... Factories... Bridges*

# COMPLETE LINES OF WALWORTH VALVES for POWER PLANT SERVICE



## Featuring Walworth Pressure-Seal Valves

Here are cast steel valves built for high-pressure, high-temperature service. The unique bonnet-to-body design utilizes internal line pressure for a tight, leakproof connection. The higher the pressure the tighter the bonnet joint! Bulky, heavy bonnet flanges, bonnet studs, and nuts are completely eliminated providing a modern valve design of truly streamlined proportions. Maintenance is simplified as Walworth Pressure-Seal Valves are easily assembled, disassembled, and insulated.

Walworth Pressure-Seal Valves are available in Series 600, 900, 1500, 2500, and in a wide range of sizes and types. Complete information is available from your nearby Walworth Distributor—or—write Walworth for a free copy of Circular 16.

and including these valves for "round-the-plant" use!



**WALWORTH SMALL CAST STEEL Y-GLOBE VALVES.** Simplified design eliminates many of the problems encountered in high-temperature, high-pressure service. No bonnet joint. Improved back-seat design means longer life for packing rings.



**WALWORTH LUBRICATED PLUG VALVES.** Easy turning—quick operating. Lubricant can be renewed while the valve is in service. Lubricant completely surrounds the plug ports for a tight seal against leaks. Remember, always use Walworth Lubricant in Walworth Lubricated Plug Valves.



**WALWORTH BRONZE VALVES.** Standardized lines of bronze valves provide an unsurpassed system of interchangeability of parts, drastically reducing inventory problems. Walseal Valves with brazing ends also available in a variety of types.



**WALWORTH IRON BODY GATE VALVES.** Straight-flow port design reduces fluid turbulence to a practical minimum. Seat rings of end-seated type are screwed into the body. Brass liner on glands assures greater resistance to corrosion and scoring. Available with threaded or flanged ends.



**WALWORTH CAST STEEL GATE VALVES.** Bolted bonnet, wedge gate, OS&Y. Bonnets and bodies are engineered to withstand pressure and minimize distortion. Heavy steel walls provide extra strength and longer life. Deep stuffing boxes in all sizes (2" to 24") insure tightness and maximum packing life. Also available in globe and angle types.

WALWORTH also offers Plastic Valves, Fittings, and Pipe of polyvinyl chloride, moulded to Walworth's specifications by General American Transportation Company of B. F. Goodrich Chemical Company Geonl

## WALWORTH

Manufacturers since 1848

valves . . . pipe fittings . . . pipe wrenches

750 Third Avenue, New York 17, N. Y.

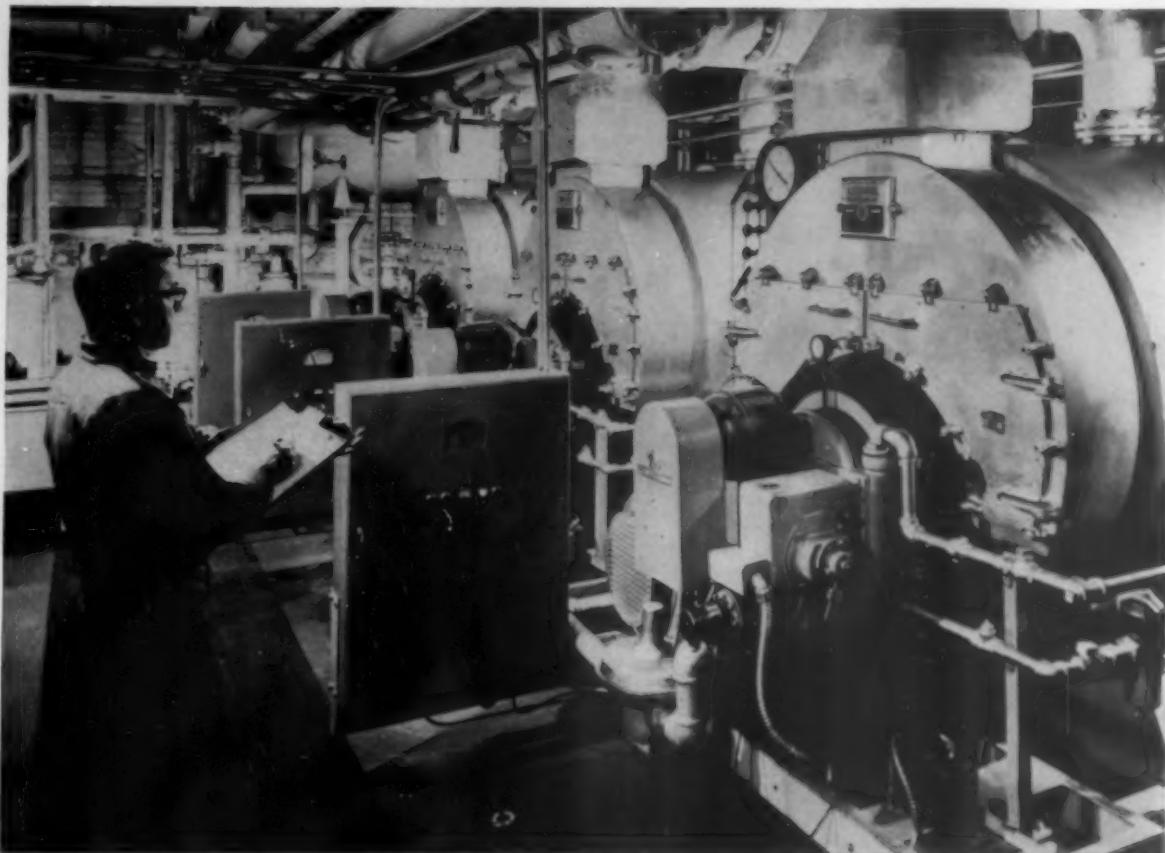
Walworth Company of Canada, Ltd., Toronto

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD



# The smart way to modernize

*... specify your heating plant in one package*



This remodeled boiler room serves the two buildings of the Columbus Dispatch newspaper plant, Columbus, Ohio. Fuels can be quickly changed in these three Iron Fireman-Kewanee gas-oil boiler-burner

units. Consulting Engineers, John Paul Jones, Cary & Millar, Cleveland; Architect, Dan A. Carmichael, Columbus; Heating Contractor, Limbach Co., Columbus.

## Iron Fireman burner with boiler — engineered as a single unit

These famous boiler-burner units are the products of two great specialists—each in its own field. They are engineered for each other. Included in one catalog, they can be ordered by a single model number from one set of specifications.

### Plenty of reserve power

You can feel *safe* in specifying Iron Fireman equipment. These thoroughly engineered units are conservatively rated. The normal firing rate is a comfortable cruising speed—less strain, low maintenance, quiet operation, higher efficiency

—and that big extra capacity is always standing by to pick up extra loads.

### Compact and complete

These complete steam or hot water generating units require little more than service connections. Automatic controls, air and fuel systems are built in. No special boiler settings; low headroom; no high stack.

*Please mail coupon for catalog and specifications.*

## IRON FIREMAN®

AUTOMATIC FIRING EQUIPMENT  
FOR OIL, GAS, COAL



IRON FIREMAN MANUFACTURING CO.  
3122 West 106th Street, Cleveland 11, Ohio  
(In Canada, 80 Ward Street, Toronto, Ontario)

Please send catalog and specifications on following equipment:

- ☐ Complete boiler-burner units
- ☐ Forced draft firing unit only

Name \_\_\_\_\_  
Firm \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

# Telephone



# manufacturer calls for coal

## Automatic Electric Co. burns coal in new plant because of cost and availability

Modern facilities, modern products, modern fuel—you'll find all three at the new Northlake, Ill., plant of Automatic Electric Co., manufacturing subsidiary of General Telephone. The power house of this communications equipment plant (designed and built by The Austin Company of Cleveland) is as modern and efficient as the manufacturing process itself. The plant required large quantities of economically and reliably produced steam for process work and heating. The fuel selected was *coal*, because of coal's economy and abundant supply. As a result, today Automatic Electric enjoys dependable, low-cost steam.

### Facts you should know about coal

You'll find that bituminous coal is not only the lowest-cost fuel in most industrial areas, as in the case of Automatic Electric, but up-to-date coal burning equipment can give you 15% to 50% more steam per dollar. Today's automatic equipment can pare labor costs and eliminate smoke problems. And vast coal reserves plus mechanized production methods mean a constantly plentiful supply of coal at stable prices.

### Technical advisory service

To help you with industrial fuel problems, the Bituminous Coal Institute offers a free technical advisory service. We welcome the opportunity to work with you, your consulting engineers and architects. If you are concerned with steam costs, write to the address below. Or send the coupon below for case histories, complete with data sheets. You'll find them informative.

### Consult an engineering firm

If you are remodeling or building new heating or power facilities, it will pay you to consult a qualified engineering firm. Such concerns—familiar with the latest in fuel costs and equipment—can effect great savings for you in efficiency and fuel economy over the years.

## BITUMINOUS COAL INSTITUTE

Department SP-04

Southern Building • Washington 5, D.C.

Shown are two of the three Keeler boilers—fired by Detroit Spreader Stokers—in the power plant. At the right is the 22,000 lb/hr boiler. In the background is one of the 50,000 lb/hr boilers. The two sizes allow flexibility in operation for widely varying load requirements.



Control panel by Hays Corporation. This system regulates all operations of the boilers—steam pressure, draft, flue gas temperature, banking periods, etc.—to give complete, automatic control of steam generating operation.



Ash disposal system, by United Conveyor Co., in basement of boiler room. Ash is removed from furnace by Detroit CC grate, drops into hoppers in basement and is taken by vacuum to silo.



The Bituminous Coal Institute now has available a free booklet adaptable for design loads 3,000 to 24,000 EDR steam. This booklet, "Guide Specifications for Typical Low-Pressure Commercial Heating Plant," contains specifications, drawings and tables on all aspects of a typical heating plant. Send in this coupon for your copy.

☐ Guide Specifications Booklet ☐ Case histories on larger plants.

Name \_\_\_\_\_

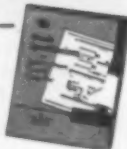
Title \_\_\_\_\_

Company \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

Zone \_\_\_\_\_ State \_\_\_\_\_



*In All*



Hammond Plant near Rome, Georgia. Three  
100,000 KW steam-electric units are in operation.

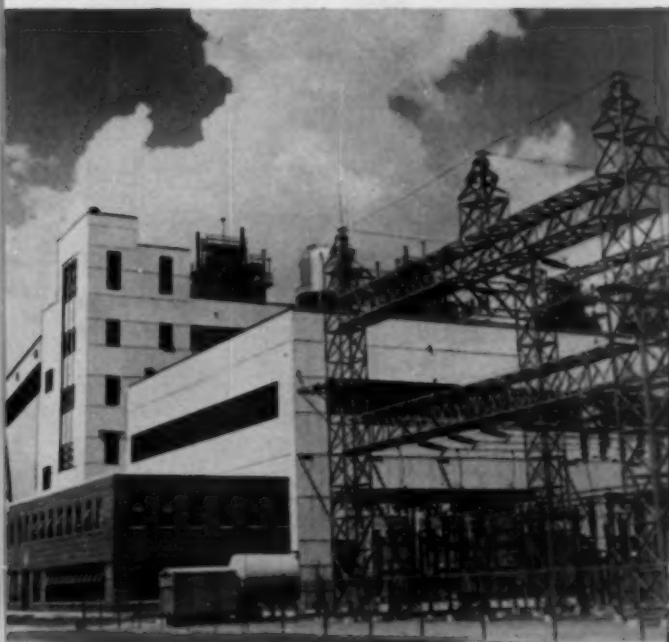
14" Alloy Steel Gate Valve  
Pressure Seal Type  
Geared Head Operation.



# 16 Steam Generating Units

## **CHAPMAN VALVES**

*do their part to serve  
the Citizens of Georgia*



Yates Plant near Newman, Georgia. Three 100,000 KW and two 125,000 KW steam-electric units in operation.

Plant Atkinson at Atlanta. Four 60,000 KW units in operation.



You'll find 16 generating stations of the Georgia Power Company located throughout that great state. More units are constantly being added. Total capacity of this huge system, existing and under construction, is 1,843,680 kw . . . an extensive service to the citizens of Georgia.

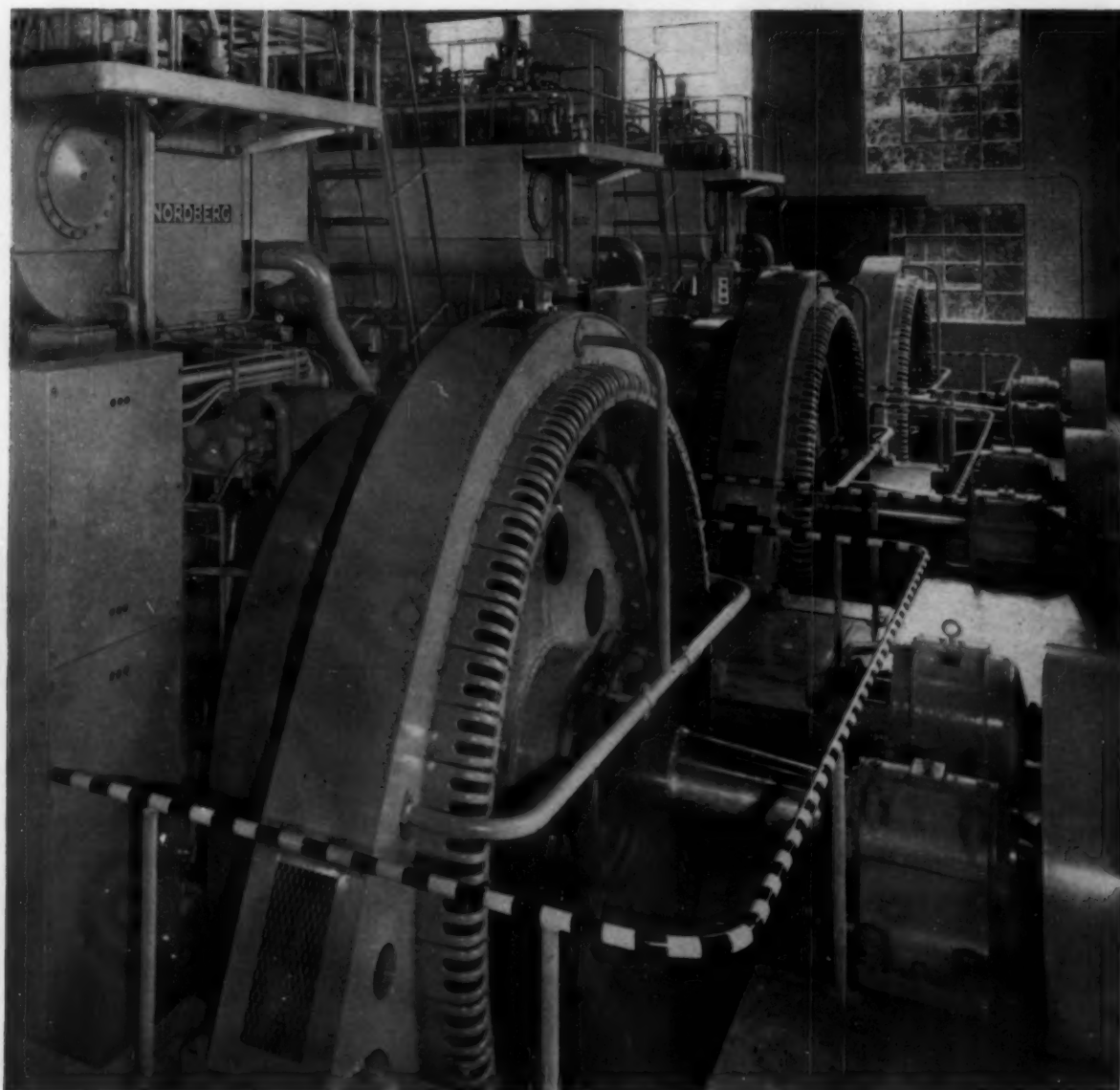
In every one of the 16 generating plants, engineered by Southern Services, Birmingham, Alabama, you'll

find Chapman High Pressure Valves playing their part.

These valves have been selected for many of the major services in each of these plants because they give excellent continuous service under severe operating conditions. They meet the growing demands of increased temperatures and pressures which are requirements for modern power plant operations.

The **CHAPMAN** Valve Manufacturing Company  
INDIAN ORCHARD, MASSACHUSETTS

*Looking ahead.* When it comes to valves, if you are looking ahead to tomorrow's requirements talk with the Company that is looking ahead . . . Chapman Valve Manufacturing Company. Chapman will plan with you, work with you, *produce for you*. Chapman has the engineers, metallurgists, experience and manufacturing facilities to design, develop, build and test the valve equipment you need no matter how tough the requirements. Write and we'll gladly consult with you.



## No Room for Error

Today's power machinery operates on close tolerances. The space available for lubricants at the actual point of friction is small. Lubricants *must* deliver full protection *in every drop*.

Throughout the South dependable, *steady* lubrication in power equipment has made Standard Oil lubricants the outstanding first choice for many years. There is no substitute

for these years of performance on the job.

If there's a doubt about lubrication in your plant remove it today. Just call in your Standard Oil lubrication specialist. He'll be glad to assist in drawing up a plan that will leave nothing to chance—and no room for error.

**STANDARD OIL COMPANY** (Kentucky)



**Here's a pump you can  
use anywhere  
GOULDS self-priming  
centripetal pump (Fig. 2520)**

*pumps liquid...air  
...liquid and air*

As a scavenger... handy transfer... for cleaning up—which way can this versatile Goulds pump work for you?

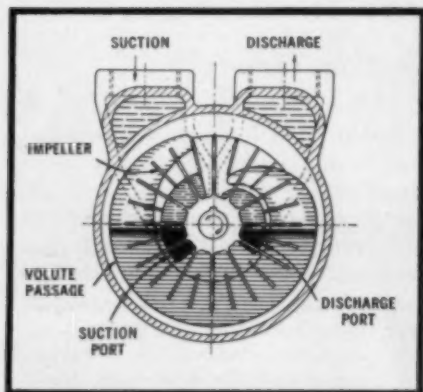
You can use it for almost anything.

Because it pumps air and liquid in any combination, it handles foaming solutions and emulsions easily. It's ideal for pilot plant work, for cleaning operations.

Once primed, it stays primed. It won't air-bind. Even with loops or leaks in your suction line, its high air-handling capacity will keep liquids moving.

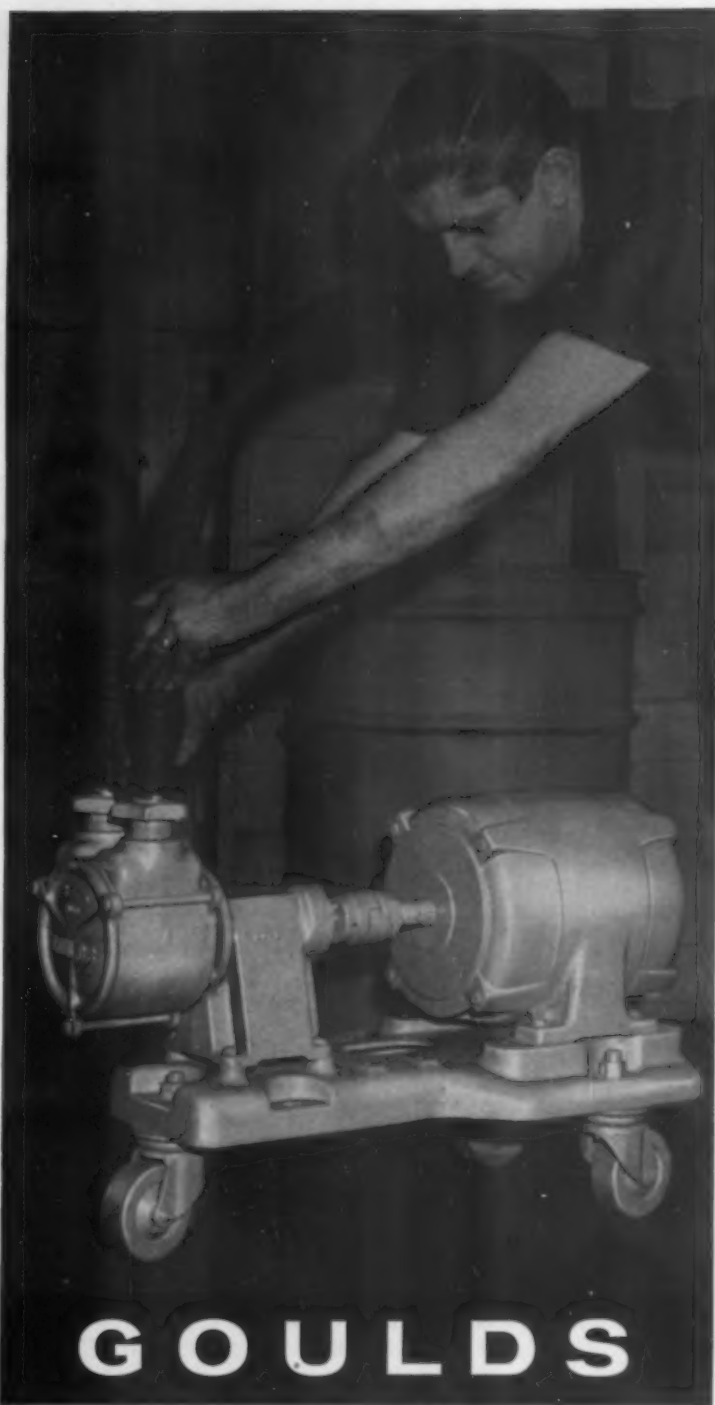
Compact, lightweight, portable—it's ready in all-iron construction, or in stainless steel for corrosive service. It's offered as a mobile unit (illustrated), pump-motor unit, or pump only for V-belt drive. The pump itself weighs 42 pounds. With 1½ inch suction and discharge, capacities go to 60 GPM, heads to 80 feet.

There's a complete description of the Liquid Ring Pump in Bulletin 725.6; you can get a copy from us or from your Goulds representative.



This new self-priming Goulds pump eliminates air-binding by a unique use of centripetal action. The impeller forces liquids along a volute casing, building up pressure as the liquid moves to the narrow end. This pressure sets up a liquid piston action between each set of blades, forcing liquids to the center of the pump. The liquid piston forces any air entrapped in the center up through the outlet.

SOUTHERN POWER & INDUSTRY for APRIL, 1958



**GOULDS**

*pumps for industry*

**GOULDS PUMPS, INC.**

**Main Office and Works, Seneca Falls, New York**

Branches and Representatives in principal cities

In Canada: The A. R. Williams Machinery Co., Ltd.

For more information, use Reply Card—Page 97



"Every effort we put into the  
**SAVINGS BOND PROGRAM**  
will be richly rewarded..."

*a statement by Julian B. Baird, Under Secretary of the Treasury*

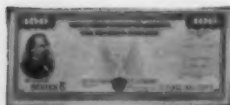
"America's great productivity has been made possible by the willingness of Americans to save a part of their incomes for investment in productive enterprises. The Payroll Savings Plan of the Savings Bond Program implants and helps to sustain the habit of regular savings, and this benefits our whole economy as well as each individual saver.

"We need savings as a continued affirmation of our

way of life. The right to build up personal savings and to choose individually our savings objectives is one of our cherished freedoms.

"I am convinced that every bit of effort we put into Savings Bond promotion as part of a broad thrift plan will be richly rewarded in the contribution we shall be making to the strength and security of our country in this critical period."

THE U. S. GOVERNMENT DOES NOT PAY FOR THIS ADVERTISEMENT. THE TREASURY DEPARTMENT THANKS, FOR THEIR PATRIOTISM, THE ADVERTISING COUNCIL AND THE DONOR BELOW



**SOUTHERN POWER & INDUSTRY**

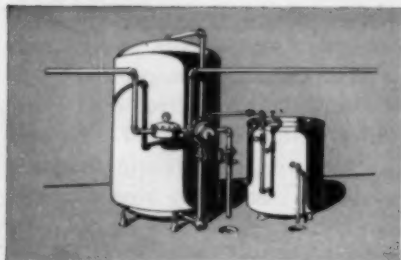




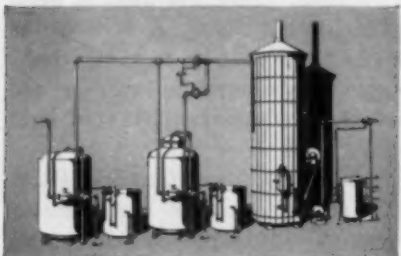
Quote and Unquote:—

## "Elgin has dug deeper into ION EXCHANGE

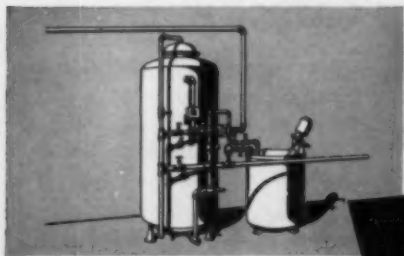
## than any other firm"



**SOFTENING BY ION EXCHANGE** — used to eliminate calcium and magnesium hardness from water. All types of ion exchangers available to meet specific conditions.



**DEALKALIZATION BY ION EXCHANGE** — produces soft water of controlled alkalinity. Various exchangers used, depending on requirements.



**DEIONIZATION BY ION EXCHANGE** — produces water of better than distilled quality. Ion exchangers of mixed-bed or multi-column design give "tailor-made" effluent to meet process or boiler plant requirements.

An engineer said this when he was asked why he had brought his not-too-simple water conditioning problem to the Elgin organization.

The particular way he put it set us to wondering how many men with water conditioning problems realize the great strides that have been made in ion exchange . . . how many recognize the vital importance of dealing with a firm that has played a leading role in ion exchange development and application.

It is always bad taste—often bad business—to boast; so we won't say that Elgin has dug deeper than *any* other organization. We simply say that certainly no firm has dug *deeper* into ion exchange application than has Elgin during nearly a half century of specialization.

It is squarely on the record that across the years we have *been a part* of the transition from the first simple greensand through the highly specialized ion exchangers and methods that are today accomplishing little short of water conditioning miracles. Just three of almost countless examples of this are given at the left.

Yes, today it can be said that there is a way to "make over" *any* water supply—*your* water supply—to exactly the kind and quality needed for *any* use. When you put your problem up to Elgin you are certain that Elgin "deep digging" will not only assure you the *right* way, but, still more important, the most *economical* way.

Never forget that Elgin works with *all* methods. No bias; no single-track thinking. One of our engineers will be glad to study your conditions and give you a demonstration of Elgin deep digging.

**ELGIN**  
**WATER CONDITIONING**  
SINCE 1908

**ELGIN SOFTENER CORPORATION**

132 N. Grove Avenue, Elgin, Illinois

Representatives in Principal Cities

In Canada: G. F. Sterne & Son Ltd., Brantford.



**Where a misstep costs \$500...  
Blaw-Knox Electroforged® Steel Grating  
provides safer non-slip footing**



*Stair falls cost industry  
over \$60,000,000 a year.*

An average accident amounts to a loss of \$500 in claims.\*

A good way to guard against these profit-eating accidents is to construct your stair treads, walkways and floors with Blaw-Knox Electroforged Steel Grating. Non-slip twisted crossbars and a wide variety of bearing bars are available to meet every kind of working condition—safely solving the most hazardous skid situations.

Rigid, one-piece construction makes installation easy. Once on the job, Blaw-Knox grating practically takes care of itself. There is nothing to wear, nothing to patch, no dirt collecting corners to clean. It goes anywhere, fitting neatly around pipes, beams and machinery, admitting plenty of light and air to the area.

Made to your specifications, Blaw-Knox grating provides new highs in safety, easy up-keep and flexible application. For new ideas about grating—including space saving platforms and shelving, write for Bulletin 2486.

\*Based on a study analyzing 803 compensable work injury claims closed in Illinois involving stairs and steps.

**BLAW-KNOX**

**BLAW-KNOX COMPANY**

*Equipment Division  
Dept. J, Pittsburgh 38, Pennsylvania*

# TIMELY COMMENTS



## Electronic "Brains"

**ENGINEERS** are just starting to learn now to apply the powerful innovation which is the electronic brain or computer, according to G-E engineers at the recent A.I.E.E. general meeting. Future contributions will be even more important than the great progress achieved by their use in the past decade.

The number, size and cost of computer installations have grown phenomenally in the last ten years. It is estimated that at present there are about 150 large-size computer installations in the world, about 1,000 medium-size installations, and probably as many more being installed, planned, or considered.

Economic significance may be assessed by realizing that the budget of a medium-size installation may be anywhere between one hundred to two hundred thousand dollars per year, and the budget for a large-size installation anywhere between half a million and a million dollars or more per year.

## Boiler Protection

**A DIFFERENT "SCHEME"** of power plant boiler protection was recently described by J. L. Barker of the Oklahoma Gas & Electric Company, at the Southwest District Meeting of the A.I.E.E. Protection system was backed up by four years' operating experience.

New protective scheme features an "energize to trip" circuit, and duplicate tripping devices, connected in parallel. Operation of either of the duplicate protective devices sounds an alarm but tripping is initiated only when both duplicate devices operate. Operation of either of the duplicate tripping devices causes the shutoff valve to close.

System is reported to overcome two major objections experienced in the use of the "time-honored fail-safe or normally energized, elec-

trical circuit" to initiate tripping of a boiler fuel shutoff valve:

1. Too many false interruptions in the electrical circuit which needlessly tripped boiler fuel;
2. Too many occasions when opening the electrical circuit failed to accomplish boiler fuel shutoff.

Mr. Barker reported that the second failing was more serious and fortunately, since such failures can cause explosions, both were found in testing and scheduled shutdowns.

Present fuel shutoff control scheme has been applied to five gas fired boilers during the last four years. But the same basic thinking and treatment can be applied to boilers using other fuels. Over the four-year period, he said no boiler has tripped or failed to trip because of device malfunctions. On three occasions a boiler would have tripped if protective devices had not been in duplicate. On one occasion one of the duplicate tripping devices failed to function.

Duplicate tripping devices need little comment. The added expense is small and the reliability of the tripping function is improved by about a four to one ratio.

## Prikladnaya . . . (PMM)

**RUSSIANS** are familiar with the content of most, if not all, of our technical publications, while only a few of theirs are translated for use by the English-speaking world.

Under a \$35,000 grant from the National Science Foundation, ASME will soon publish the bi-monthly "Journal of Applied Mathematics and Mechanics." It will be an English translation of the leading Russian technical journal known as "Prikladnaya Matematika i Mekhanika" — usually abbreviated PMM.

Magazine contains the latest theoretical and practical advances in mathematics, fluid dynamics and solid state physics. Subscriptions will be sold by The American Society of Mechanical Engineers at \$35 for the six issues.



Increasing deoxidation—a key step in the manufacture of new 4-D Wrought Iron.

*Now—from Byers Research—  
an even better Wrought Iron  
for modern corrosion control—*

# *new 4-D wrought iron*

Out of the laboratory and into production comes a newly formulated Wrought Iron to strengthen man's arsenal of corrosion resistant weapons.

New 4-D Wrought Iron is at least 25% more corrosion resistant than standard Wrought Iron—long an industry standard for superior corrosion resistance. This significant metallurgical advance is the result of 17 years of continuing research by Byers metallurgists.

And here's what it means to you.

Seventeen-year in-service and laboratory tests prove that 4-D Wrought Iron is superior not only to standard Wrought Iron, but has much greater corrosion resistance than other materials which are sometimes offered as substitutes. Thus, the economy of using standard Wrought

Iron can now be compounded through the use of new 4-D Wrought Iron.

In addition to increased corrosion resistance, new 4-D Wrought Iron has greater uniformity and improved physical and mechanical properties. This is attained by substantially increasing the deoxidation of the base metal, increasing its phosphorous content, and using a more siliceous slag.

*And the price of new 4-D Wrought Iron? No increase. Despite higher production costs, the price of Wrought Iron will remain the same.*

Write us for new 4-D Wrought Iron literature, or contact the Byers representative for complete details. A. M. Byers Company, Clark Building, Pittsburgh 22, Pa.

**BYERS Wrought Iron Tubular and Hot Rolled Products**

ALSO ELECTRIC FURNACE AMBALLOY STEEL PRODUCTS AND PVC PIPE

**Corrosion costs you more than Wrought Iron**



# INDUSTRY SPEAKS



## AIRCRAFT and MISSILES

**THE SOUTH & SOUTHWEST** now has some 110 aircraft and missile plants, compared with only half dozen at the end of World War II. The South is the center of some of the nation's most advanced aeronautical programs. The country's first artificial satellite was launched from a southern base. Other groups are working on intercontinental guided missiles and aircraft powered by atomic energy. But most important is that the South has obtained several of the country's key aeronautical research installations.

With this as a basis, plus a variety of favorable plant location factors, the South is well on the way to becoming the nation's top region for aircraft development.

Texas ranks as the number one aircraft-producing state in the area, with heavy concentrations at Fort Worth and Dallas. Aircraft employment in these two cities totals 42,000 with an annual payroll of \$200 million. Area is second only to Los Angeles in aircraft manufacture.

The Convair plant is developing the B-58 supersonic bomber and is working on the design of the world's first nuclear powered aircraft. Bell Aircraft has produced some 1,200 helicopter units during the past five years. Chance Vought manufactures the Navy's F8U-1 Crusader jet fighter, as well as the Regulus missile. Temco Aircraft has a new primary jet trainer and an aerial drone system which enables pilotless planes to perform dangerous reconnaissance missions.

Florida has made fast progress in the field, particularly in the production of component parts by smaller companies. Among the larger companies, Fairchild Aircraft has located a major plant at St. Augustine. United Aircraft has an engineering facility at St. Petersburg. Martin opened its huge Orlando plant early this year to produce missiles and electronic control systems for air defense.

In Georgia, Lockheed Aircraft has two major facilities. The Marietta plant is one of the

largest industrial plants in the South, with some 19,000 workers and a payroll of \$90 million producing B-47 jet bombers and C-130 prop-jet transports. Lockheed is now completing a huge plant at Dawsonville for the development of nuclear powered aircraft.

Douglas Aircraft produces B-47 bombers and C-132 cargo transport planes in Tulsa, Oklahoma and has a missile unit at Charlotte, North Carolina.

Maryland has several of the nation's oldest and best known aircraft manufacturing facilities — Martin at Baltimore, Fairchild at Hagerstown and Flight Refueling at Baltimore. In Alabama, Hayes Aircraft operates a major modification center at Birmingham, employing over 6,000.

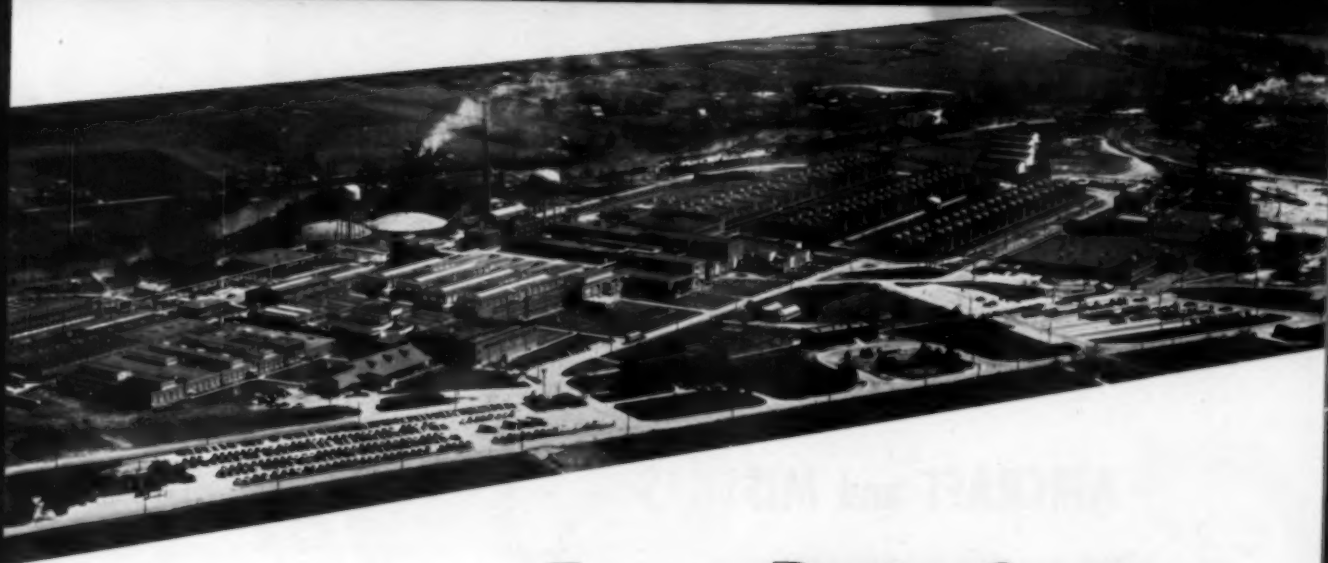
Key aeronautical research centers in the South include several bases for the nation's most advanced work in the guided missile field. Patrick Air Force Base, near Melbourne, Florida is the main base for the 5,000 mile long guided missile range which extends across the South Atlantic.

Redstone Arsenal near Huntsville, Alabama is the nerve center for the Army Ordnance's missile research and development activities. Total investment at Redstone is \$150 million and personnel includes some 7,000 with an annual payroll of \$40 million. Its facilities are being substantially enlarged, as well as those of related industries, such as operated by the Thiokol Corporation and Rohm and Haas.

Another key facility is the Air Force Engineering Development Center at Tullahoma, Tennessee. At the Allegheny Ballistics Laboratory near Cumberland, Maryland booster rockets for guided aircraft missiles have been developed as well as free-flight ground-to-ground artillery rockets. Sperry Farragut Company operates a missile development at Bristol, Tennessee. The Navy has an 8,600 acre rocket station at Camden, Arkansas and at McGregor,

*(Continued on Page 64)*

Adapted from comments by FRANK J. SODAY, vice president, research & development, THE CHEMSTRAND CORPORATION, Decatur, Alabama.



# Epoxy Resin Coatings

## Solve Corrosion Problem for North Carolina Paper Mill

**THE ECUSTA** Paper Division of Olin Mathieson Chemical Corporation started testing various types of paints and methods of surface preparation for preserving plant equipment and structures in 1952. The goal was to find the best means for restoring the pulp mill section of the plant and for maintaining it at an economical cost per year.

The painting program was completed about 2 years ago, and it is

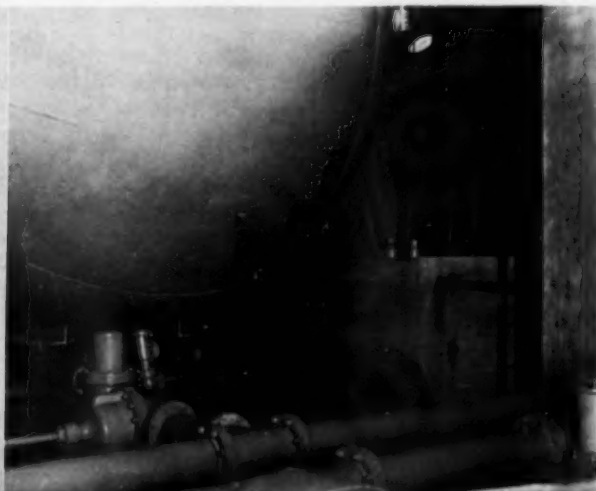
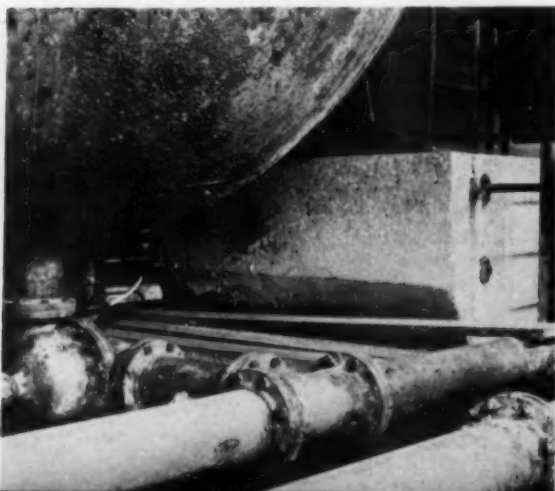
estimated that painting frequency will be cut in half as compared to former requirements. So far there has been no reason to feel that results will fail to meet this optimistic view.

There have been no instances where the paint failed to do what it was applied to do; namely, to protect the buildings and equipment from rust and corrosion resulting from the exposure to moisture and chemical fumes.

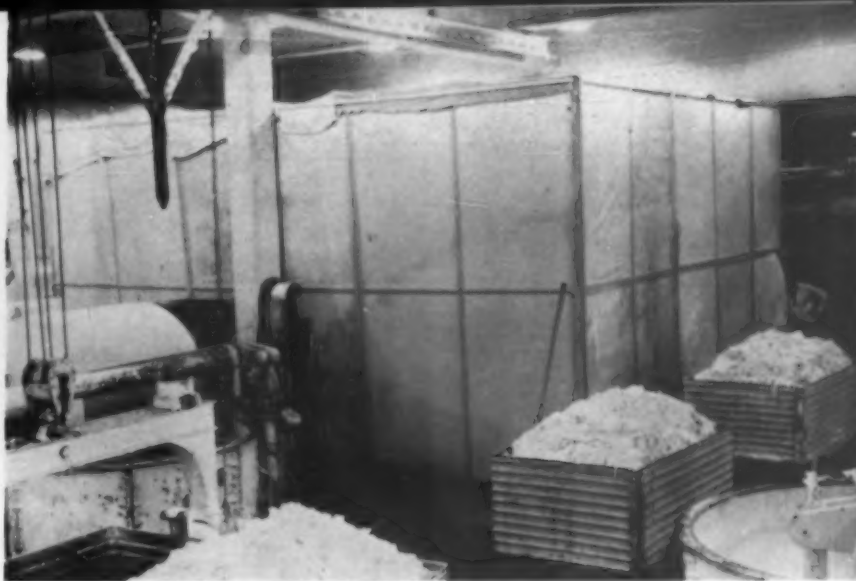
In areas subjected to aggressive chemical action, unmodified epoxy resin coatings were applied. These were supplied by the Porter Paint Co., Louisville, Ky., and the Gilman Paint Company (Gilpon), Chattanooga, Tenn. Gilpon coatings are distributed by the Olney Paint Co. of Spartanburg, S. C.

In areas where the object to be painted was not subjected to attack by chemical fumes but only needed to be protected from rust

Corrosion was evident on this chlorinator sphere before refinishing operations were started. Note difference after sandblasting, priming, and two finish coats of epoxy resin. These coatings stand up in plant areas subjected to moisture and chemical fumes.



Framework covered with fabric provides enclosure for equipment during refinishing operations, thereby preventing contamination of nearby production in refining room. Ample protection was provided throughout with no loss of production.



**By TED CAMPBELL**

Construction Supervisor  
Ecusta Paper Division, Olin Mathieson Chemical Corp.  
Pisgah Forest, North Carolina

caused by moisture, paints of the 100% phenolic resin type were used. These were supplied by the Pittsburgh Plate Glass Co.

**Paints Tested**

For two years numerous types and brands of paint as well as several methods of surface preparation were tried. All paints tested were actually applied to the building structure, processing machinery, or some allied equipment

or piping. Test panels were not used because a panel coated under ideal conditions in a paint shop and then placed in the test area is not equal to a sample applied directly to the object under everyday operating conditions.

All of the paints that are available on the market were not tested but the ones tested did include some of the so-called, one-coat jobs that are simply applied over rusted metal or any other surface,

wet or dry. All of these preparations failed to meet our standards.

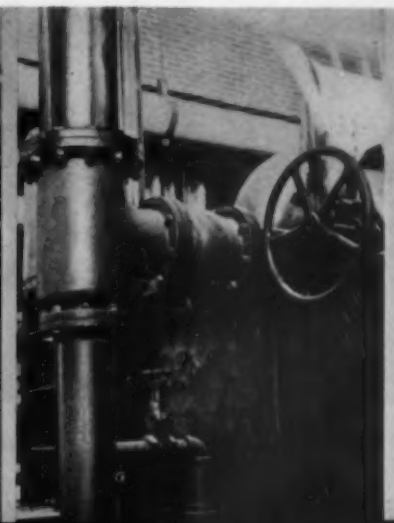
**Surface Preparation**

Methods of surface preparation tested included: chipping and wire brushing by hand, power operated chippers and wire brushes, power sanders, and finally sandblasting.

The result of this testing program was the adopting of sandblasting as the standard method of surface preparation for metal. No other method tried approaches sandblasting in thoroughness of cleaning, rate of production, or economy.

At the end of the two-year test period management decided on using paints of the unmodified epoxy resin type, and these were

These three views show piping at breaker beater near digester; before sandblasting, after application of dark primer coat, and after light colored finish coat was applied.





Steel ceiling beams and concrete slab are illustrated at left before sandblasting operations were started. The center view is after sandblasting and application of primer coat on beams. The right view shows the finished job.

standardized on in the plant.

The sequence for applying the paint was the same for all surfaces: (1) Sandblast surface to gray metal; (2) Apply prime coat at once; (3) Apply first coat of finish tinted slightly off color; (4) Apply second (and finish) coat.

If any delay occurred between the sandblasting and application of prime coat, the surface was washed with a solution of phosphoric acid and alcohol to kill any new rust that had started to form.

The first finish coat is tinted slightly off color to keep it from blending with the final coat. This is done so that if any of the surface is missed in applying the final

coat, it is easily detected.

While all of the metal surfaces of the machinery, structural building steel, and process piping were being cleaned, the crew also sandblasted all previously painted concrete and brick surfaces of the buildings. These masonry surfaces were not repainted, and no valid reason appeared to justify expending the labor and material to paint them. Nothing was found objectionable about the appearance of clean concrete and brick surfaces.

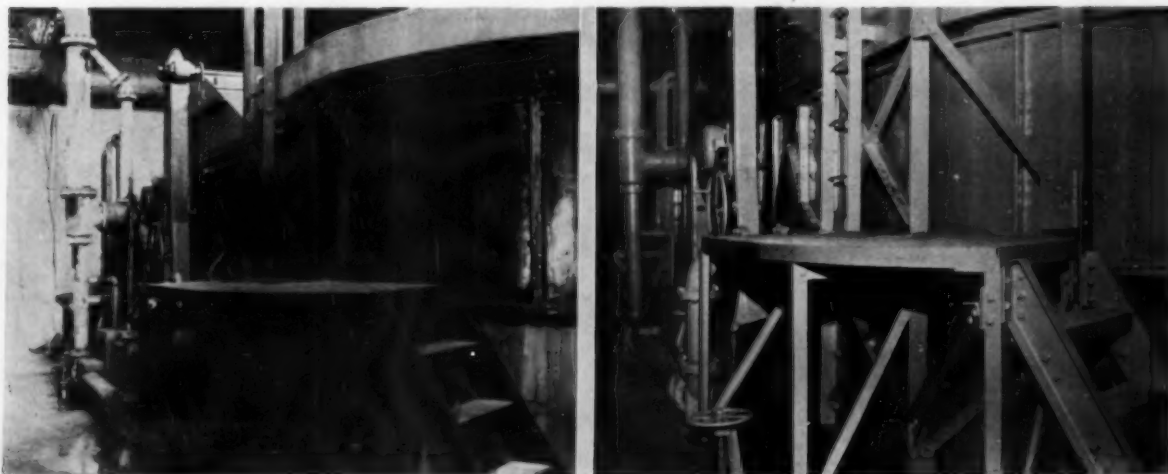
#### Materials and Labor

The manufacturing area covered by the program included 118,000

sq ft of floor space, and the cost per sq ft of floor space varied from \$.60 to \$1.30 for direct labor and materials. This figure includes only man-hours of labor and actual materials; it does not include contractors overhead and profit.

The materials used included 960 tons of sand, 250 gallons of acid wash, and 3,500 gallons of paint. The painting crew included one foreman, sixteen painters, all working on a 40-hour work week. The work was started on June 1, 1955, and was completed on May 28, 1956. No production was lost as a result of the work, and there was no machine downtime resulting from the work.

This processing beater contains caustic materials and appeared as at left after application of primer coat. The finish coat of epoxy resin has been applied at right.





# Insulation Forms Jacket



**THE IDEAL** way to build a low temperature room is to completely envelop the space with an unbroken layer of insulation, but this is generally a difficult procedure. The problem basically is one of avoiding "thermal short circuits" through the columns supporting the roof or around the conventional beams where they join the sidewalls.

Libby McNeill & Lilly solved this problem in constructing its new Ocala, Florida addition by using cellular glass insulation, and a special arrangement of columns, walls and roof.

This design enabled them to lay their floor, cover it with insulation and actually support the columns on concrete pads bearing directly on the insulation. The roof structure is supported by the columns and cellular glass insulation covers the roof decking.

Sidewalls were erected independently, leaving a 9-in. clearance between the walls and roof decking to allow the wall insulation to pass through and link with the roof insulation. A non-setting mastic was used as joint sealer at the juncture of the roof and wall

insulation to allow for expansion and contraction.

The roof decking was corrugated transite sheets with Zonolite concrete used to fill the corrugations and make a flat deck on which to install the insulation. This deck was mopped with hot asphalt prior to the application of two layers of 4" Foamglas.

Concrete was poured over the floor insulation and a built-up roof went over the roof insulation. The walls were simply painted with aluminum paint. The result was a complete envelope around the refrigerated area.

Roof is supported on interior columns (right) which rest on floor insulation. A gap was left around perimeter of roof decking. Cellular glass insulation (Foamglas — a product of the Pittsburgh Corning Corporation) was continued up wall and through gap to link with roof insulation, giving a complete envelope of insulation around freezer space.



# Radioisotopes . . . New Uses

**INDUSTRIAL** application of radioisotopes is an extremely important peaceful use of atomic energy that is partially obscured by the more dramatic nuclear power.

According to Dr. Willard F. Libby of the Atomic Energy Commission, American manufacturers now report annual cost savings \$120 million through the use of radioisotopes. These savings are expected to rise to \$1 billion annually in two or three years and eventually reach \$5 billion annually. These enormous potential savings make practical investigation of the possible uses of radioisotopes in a variety of manufacturing operations a matter of vital importance.

The use of isotopes in industry and medicine predates the atomic era. However, the high cost of isotopes prohibited their large-scale use in industry until the availability of nuclear facilities in the atomic era increased the supply of isotopes and reduced prices to reasonable levels. With increased use the cost of isotopes is expected to decrease even more. The widespread use of isotopes today make them the first extensive practical application of nuclear energy.

## Nature of Isotopes

Formerly, the atom was defined as the smallest indivisible particle of a chemical element. We now know that the atom can be split. However, the resulting fragments are no longer identifiable with any particular chemical element but are components of any and all chemical elements.

An atom of any chemical element is composed of a nucleus formed of neutrons and protons

about which circulate other particles, known as electrons, in a planetary system. The proton has a positive electric charge, the electron has a negative charge, and the neutron has no charge at all. The mass of a proton is approximately 1,800 times that of an electron and is nearly equal to that of a neutron.

An atom is electrically neutral and therefore the number of protons in its nucleus must be equal to the number of electrons in its planetary orbit. The neutrons obviously do not affect the electrical neutrality since they have no charge. The chemical nature of an element is fixed by the number of electrons or protons. Therefore every atom of a specific element has the same number of electrons and protons, but it is possible for the atoms of a given chemical element to have different numbers of neutrons in the nucleus and yet have its chemical nature unchanged. Atoms of the same chemical element with different numbers of neutrons in their nuclei are called isotopes.

Isotopes of chemical elements (for example heavy water and ozone) are found in nature. These particular isotopes are stable because they are not radioactive. Many isotopes of uranium also occur in nature and these are radioactive and hence unstable. Natural isotopes whether stable or unstable must be separated from other matter by physical or chemical means.

Artificial radioactive isotopes, or radioisotopes, are produced by inserting a substance in a nuclear reactor, or they may be separated from waste fission products resulting from nuclear reactions.

The nuclei of the substance absorb neutrons and radioisotopes are formed. A cyclotron can be used to bombard the nuclei of a substance and thereby produce an isotope.

A radioisotope will seek to become stable. It may emit a gamma ray to form another unstable radioisotope. This unstable radioisotope may then become a stable isotope by emission of beta radiation, a process known as beta decay. In a given period of time a definite portion of the nuclei in a specific radioisotope will become stable. The time required for one-half of the nuclei to return to a stable state is called the half-life of that radioisotope.

## Availability

At present over 80 radioisotopes are available from Oak Ridge National Laboratory, Oak Ridge, Tennessee. Information on the characteristics of these isotopes is available in a table which lists the half-life and the type of radiation for each. The half-life for the various isotopes differs greatly . . . from 24.2 seconds in the case of silver 110 to 87,200,000 years for iodine 129. Thus a radioisotope of almost any half-life may be selected.

Some radioisotopes are also produced in the Brookhaven Research Reactor, the Materials Testing Reactor (Phillips Petroleum Company, Operators) at Idaho Falls, Idaho, the Hanford Reactors and the Savannah River Reactors. Stable isotopes, excepting deuterium, can be obtained from the Oak Ridge National Laboratory. Deuterium is distributed by the Savannah River Plant. Industries may also have their own materials

**By JOHN F. LEE**  
 SPI Consultant on Atomics and  
 Professor of Mechanical Engineering  
 North Carolina State College

irradiated in the government reactors at Oak Ridge, Argonne, Brookhaven and at Idaho Falls.

Approximately 50 private companies also sell radioisotopes and about 20 private companies distribute stable isotopes. Whether obtained from one of the government facilities or a private concern, a license is required for the purchase of radioisotopes with the exception of small quantities of low radiation. Recently the regulations governing the possession of radioisotopes have been relaxed and it is possible to obtain limited quantities of certain radioisotopes under a general authorization. Certain devices utilizing radioisotopes are now available without the need of a specific license.

The licensing procedure has been greatly simplified and the program of pre-licensing visits to the applicant's facilities has been greatly expanded. Training programs for the safe use of radioisotopes by industrial personnel are available. These programs are short and not unduly expensive.

A price list for available radioisotopes can be obtained from the U. S. Atomic Energy Commission, Isotopes Division, Oak Ridge, Tennessee. Table 1 gives the present price of some important radioisotopes and the expected price, estimated by Dr. Libby, when the eventual volume of radioisotopes sales is reached.

#### Applications

The applications of radioisotopes range through a large variety of industrial uses as shown in Table 2. The data presented in Table 2 were obtained from the Atomic Energy Commission. It will be noted the number of licensed users

Isotope	Present Price (Dollars per Curie)	Eventual Price (per Curie)
Cobalt — 60	9	6 cents
Hydrogen — 3	2	25 cents
Carbon — 14	22,000	\$110.
Sulfur — 35	2,000	0.5 cents
Iodine — 131	550	0.04 cents
Cesium — 137	10	30 cents

Table 2 — Estimated Savings to Industry  
 from Use of Radioisotopes During 1957

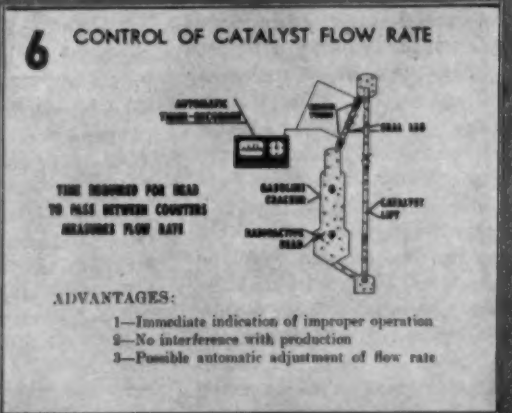
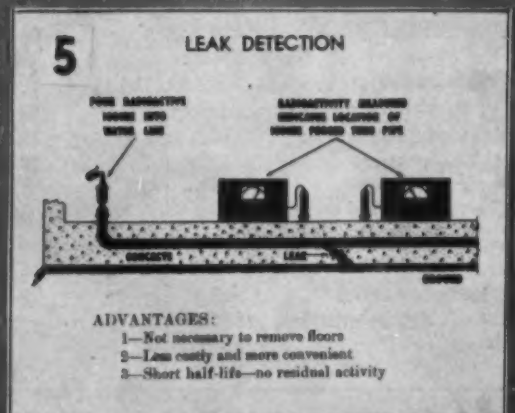
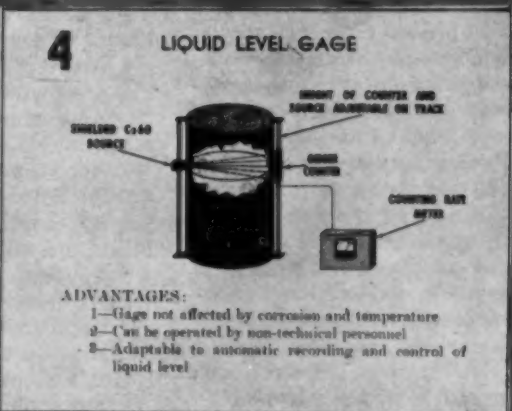
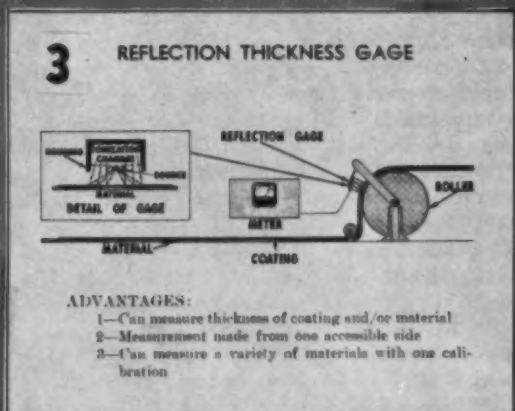
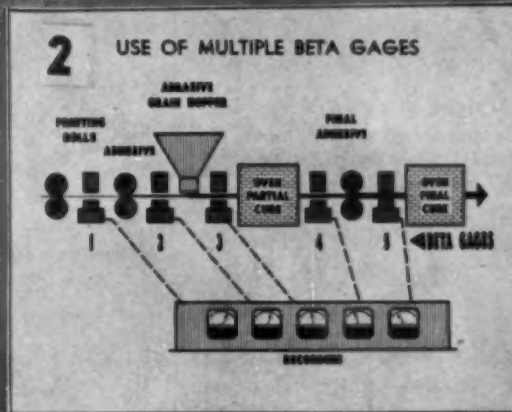
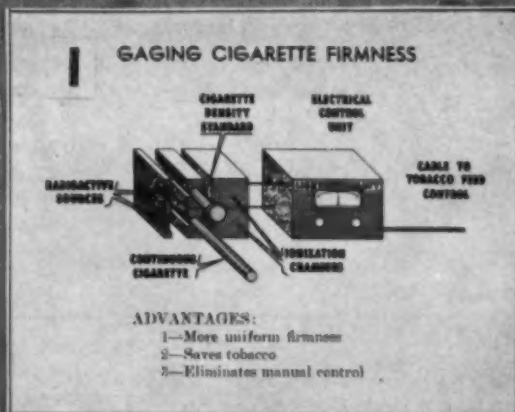
Application	Millions of Dollars	
	Probable Low	Probable High
Cigarette density gages . . . . .	42.7	57.0
Approximately 2,716 licensed.		
Paper and allied products thickness gages . . . . .	23.1	24.9
Approximately 372 licensed.		
Metal thickness gages . . . . .	18.5	27.8
Approximately 161 licensed.		
Rubber and tire fabric thickness gages . . . . .	8.0	20.3
Approximately 122 licensed.		
Plastic and adhesive thickness gages . . . . .	2.0	6.1
Approximately 135 licensed.		
Other thickness gages . . . . .	2.3	6.9
Approximately 153 licensed.		
Gages such as liquid level, moisture, H-C ratio, snow, etc. . . . .	2.5	7.6
Approximately 422 licensed.		
Radiographic testing . . . . .	28.7	64.6
Approximately 552 organizations.		
Oil well stimulation (acidizing) . . . . .	120.0	180.0
Oil well logging . . . . .	16.0	24.5
Petroleum refining . . . . .	5.3	10.1
Pipeline oil flow . . . . .	0.5	0.7
Other applied industrial tracing . . . . .	12.5	25.0
Piston ring and similar wear studies . . . . .	12.0	18.0
Tool wear studies . . . . .	0.8	1.2
Corrosion studies . . . . .	3.0	4.6
Other industrial research . . . . .	12.0	18.0
Luminescent sources . . . . .	1.7	2.7
Miscellaneous industrial applications . . . . .	0.5	0.8
Approximate total savings in millions.	\$312.1	\$500.3

for each category is given in the table for 1957. The savings include such items as reduction in man and machine time and materials used in manufacture and improved uniformity and quality of product.

The data on which the estimates are based were obtained by visits to 40 manufacturers of equipment

employing isotopes and users of this equipment and from written inquiry to more than 100 other users.

The principal use of isotopes is either as a tracer or as a source of radiation. Radioisotopes are useful as tracers because of their ability to emit radiations and their chemical identity with stable



isotopes of the same element.

A trace quantity of a radioisotope in a large quantity of a stable isotope enables the detection of the isotope mixture at any step in a process through the tracer's emission of radiation.

A radioisotope may emit one or more of the three radiations — alpha particles, beta particles, and gamma rays. As these radiations pass through materials, they are slowed down and finally stopped, the degree of attenuation depend-

ing on the material and its density. Several methods may be employed for measuring the degree of attenuation. Gamma-emitting radioisotopes, such as Cobalt-60, are used to supplement or replace conventional X-ray equipment.



## Examples of Use

Nine leading applications of radioisotopes of particular interest to Southern industries are shown in Figs. 1 through 9. These charts were provided by the Atomic Energy Commission.

Among the important industrial uses of radioisotopes are the measurements of density, thickness of materials and thickness of coatings in the manufacturing process. A deviation signal can be actuated when the material deviates from specification and the process controlled by a feedback mechanism.

The thickness, or density, of a material or product is measured by detecting the attenuation or absorption of radiations passing through the material from a source located on the other side. The total absorption of radiation varies directly with the mass of a given material. For example, a continuous cigarette placed between a radioisotope source and a detector (See Fig. 1) can provide for measurement and control of uniformity of cigarette thickness or density of a rapidly moving material within one per cent.

Beta gages can be used at different points in a process so that the readings from two successive gages are compared automatically to control how much material is being added or removed. (See Fig. 2.)

Thickness of coating materials can also be measured by detecting reflected radiation. In this method the radiation passes through the coating and is reflected by the supporting material back through the coating. The double pass through the coating improves the sensitivity of measurement. (See Fig. 3.)

The intensity of radiation from a source may be varied by varying both the distance and the shielding between the radioisotope and the detector. The measurement of liquid levels are obtained by the use of both principles. In the application shown in Fig. 4 the radiations are appreciably attenuated by the fluid, thereby decreasing the intensity registered on the meter.

Fig. 5 shows how radioactive tracers can be used for locating

leaks in pipes buried in concrete or under ground. It is possible to locate a leak within a few inches because of the concentration of radioactive material around the leak.

In the refining of gasoline, one stage of the process, catalytic cracking, requires knowledge of the rate of catalyst circulation. The catalyst is in the form of millions of small porous beads that circulate through the refining unit. The efficiency of the operation is dependent upon the rate of bead flow. A half dozen or so of the beads are impregnated with radioactive zirconium and the flow rate determined as shown in Fig. 6.

Fig. 7 shows a simple method for conducting wear tests. The component to be tested, such as the piston ring in this example, is made radioactive in a reactor and is then subjected to wear. The material worn away is collected and its radioactivity is determined and translated into the weight and thickness of the material lost. This testing procedure is simpler, faster and more accurate than conventional methods and is especially valuable in lubrication studies.

In some instances it is necessary to know the thickness of materials in "blind" locations. For example, in some operations it is necessary to replace firebrick ahead of complete failure to avoid the risk of wear below the safe thickness. Radioisotopes are employed to determine the exact amount of wear. In some applications, a trace of radioactive material is put in the firebrick at the minimum thickness. Hence, a continuous signal is received by a detector located just outside the furnace. When the signal stops the minimum thickness has been reached and an alarm is sounded to warn that the firebrick has worn through the radioactive source.

Fig. 8 shows a typical radiographic test in which radioactive sources supplement or replace X-ray machines. This method permits radiographic examinations that would be impossible or uneconomical by X-ray.

It is frequent practice to make oil wells more productive by acidizing limestone barriers. Locating the acid deep in the ground by

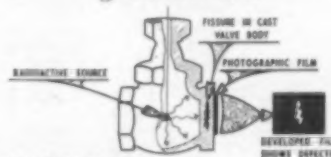
## 7 FRICTION AND LUBRICATION STUDIES



### ADVANTAGES:

- 1- TRANSFER OF METAL MEASURED TO PISTON RING
- 2- OIL SAMPLED DURING OPERATION OF MOTOR
- 3- DEVELOPED FILM SHOWS LOCATION OF WEAR

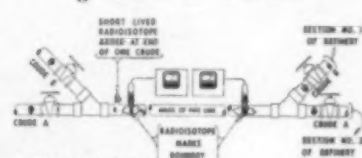
## 8 RADIOGRAPHY TESTING



### ADVANTAGES:

- 1- VERSATILE AND RELIABLE INSPECTION
- 2- INSPECTION MADE WITHOUT DISMANTLING
- 3- SOURCES OF DESIRED SHAPE AND SIZE
- 4- VERY HIGH ACTIVITY SOURCES AVAILABLE AT LOW COST

## 9 TRACING OIL FLOW IN PIPE LINES



### ADVANTAGES:

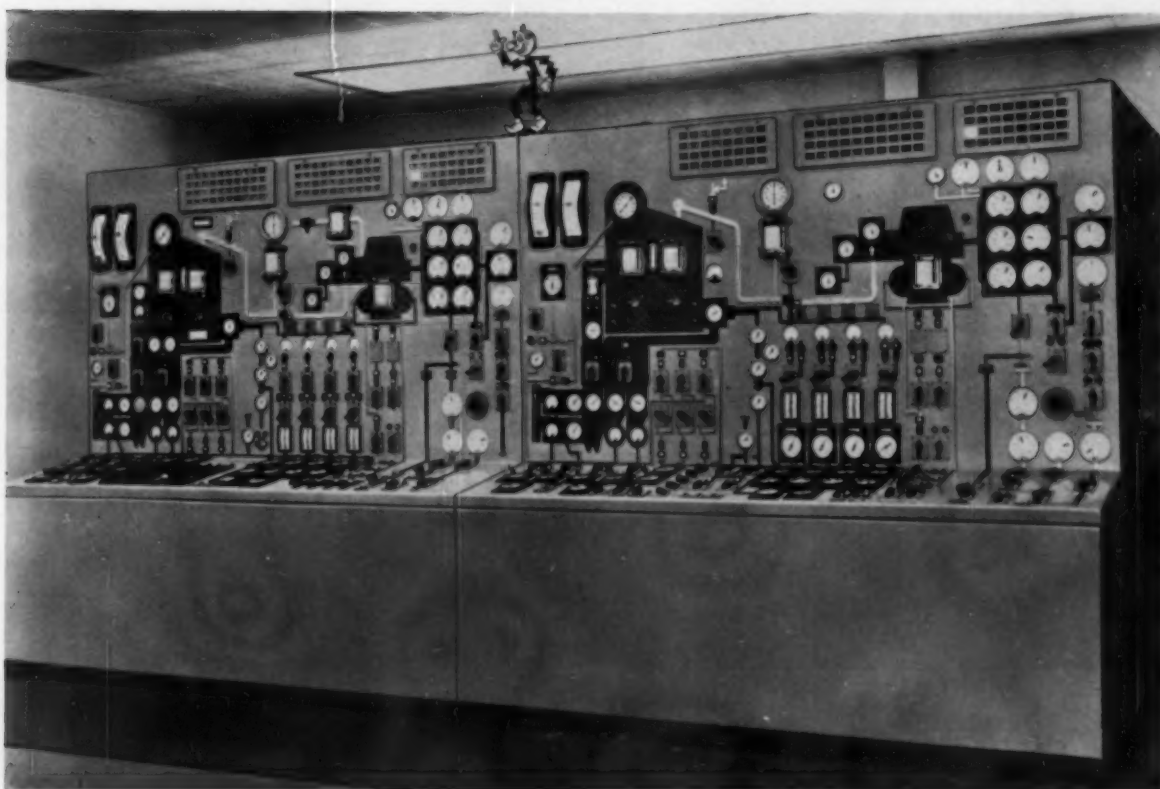
- 1- RADIOACTIVE "MARKER" CAN BE TRACED OVER LONG DISTANCE
- 2- "MARKER" SPREADS TO ONLY SMALL OIL VOLUME
- 3- PERMITS SEPARATION OF CRUISES WITH MINIMUM OF LOSS
- 4- METHOD QUICK AND REQUIRES NO SAMPLES

tagging it with an isotope makes for economy in time and in the amount of acid used.

Radioisotopes are used to mark the interfaces of different liquids flowing in a pipe line. (Fig. 9) Arrival of a "tagged" interface triggers a relay to open and close the valves so that the liquids will be directed to the proper tanks. The rate of flow in a pipe line is measured by timing the arrival of deposits of radioactivity in a liquid.

## Future Service

The industrial applications of radioisotopes just mentioned are by no means all that are at present in practical uses. The science is still in its infancy and resourceful engineers will continue to find new uses. As experience is developed, economics will increase, and peaceful use of isotopes may for some time be more important to industry than the more glamorous atomic power which is difficult and expensive to produce.



## Controls for Sutton Plant . . . Wilmington, N. C.

**SIMPLICITY** of circuit design features the combustion control for Units 1 and 2 in the Louis V. Sutton Steam-Electric Generating Station of Carolina Power & Light Company, Wilmington, North Carolina. The control system, built by Copes-Vulcan Division, Blaw-Knox Company, has independent control loops on air flow, fuel loading and furnace pressure. High-speed response of each component makes inter-connection of control loops unnecessary.

All controllers are plug-in type. All flow transmitters have friction free "transverters" for pneumatic square-root conversion. There is remote pneumatic adjustment of the steam flow — air flow ratio. Station and controller design facilitates remote switching from automatic to manual and vice versa, and shortens the tubing between controller and controlling drive

unit, valve or other device. All recorders, selector stations and flow integrators are of the miniature type, permitting reduction in size of the operating panel.

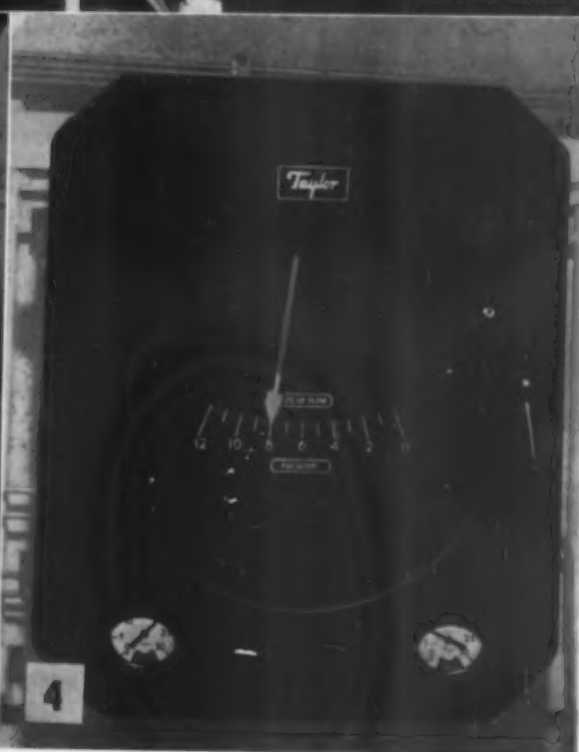
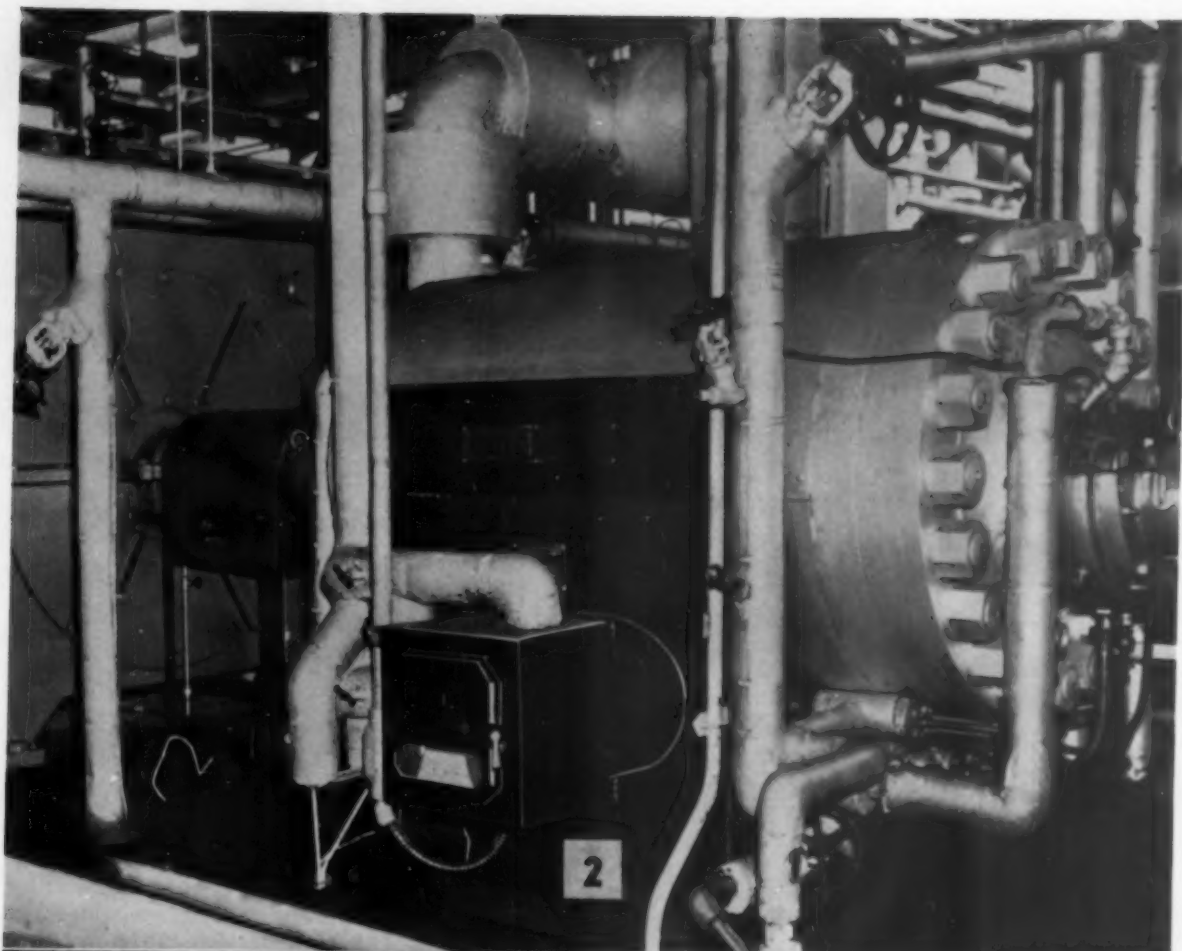
Sutton Station, with a yearly capability of 1½ billion kilowatt hours, was designed and constructed by Ebasco Services, Incorporated. It is served by two 1750-psig, 1005-degree F steam generators. Unit 1, by Combustion Engineering, Inc., is rated at 950,000 lb/hr. Unit 2, by Babcock & Wilcox, is rated at 850,000 lb/hr. While the units are initially fitted for coal firing, they are designed and constructed for conversion to burning fuel oil or natural gas, should the relative prices of these fuels justify their use.

Both steam generators have dry-bottom furnaces, economizers, two regenerative air heaters and mechanical dust collectors. Oil burners with electric ignition are

provided for lighting the pulverized-coal burners.

The plant operates on the unit-cycle basis, each boiler serving one 100-mw preferred-standard turbine-generator operating at 1450 psig and 1000 degrees FTT.

1. (above) — Plant uses centralized control for each generator unit.
2. (next page) — Boiler feed pumps are protected against low discharge by flow controller which actuates a recirculation valve in pump discharge.
3. Pneumatically powered induced-draft-fan damper operators.
4. Steam flow-air flow ratio controller maintains correct secondary air flow by adjusting forced-draft-fan dampers.



## Faster Solutions of Manufacturing Problems for Memphis Factory

THE BRAIN THAT NEVER FORGETS. Once you tell this IBM 705 what you want it to do, you can relax — knowing that for a lifetime, if necessary, it will “remember” your instructions and carry them out with unbelievable speed and accuracy. These magnetic tapes that Doug Maddux, Bill Brown and Hiram Harris, of General Shoe are inspecting, memorize the information.

# Electronic Brain Power

By **HAROLD C. GOODRUM**  
General Shoe Corporation

IN THE QUIET atmosphere of a room on the second floor of General Shoe Corporation's main office building in Nashville, Tennessee, far removed from the hustle and bustle of manufacturing operations and the selling of shoes, 17 mathematically-minded men are busy charting this company's further ascension into the world of “electronic brains.”

These men, with their multitude of charts, graphs and notebooks, began their venture into this field (at least a portion of them did) back in January, 1956, when Bill Brown, Doug Maddux and Harold Flintoff, all of our Administrative Methods and Procedures staff, undertook a study of the advisability of General Shoe installing the biggest of the “brains,” the IBM 705 Electronic Data Processing Equipment.

The name of this device sounds no more weird than the equipment itself. Reduced to simplest terms, the vast array of machines that make up the 705 are little more than improved accounting machines that work faster than the familiar adding machines, calculators, comptometers and other types of electric accounting machines.

General Shoe, on the advice of the above mentioned men, ordered a 705 from IBM in March, 1957. The delivery date is set for November, 1958.

This electronic data processing equipment is not new in itself by any means, but its step into the shoe industry is a comparatively new development. General Shoe will now become the second shoe company to have an installation. They will not be the last. The competitive nature of this industry will force others to follow suit, as it has General Shoe.

The ever-growing complexity of manufacturing, wholesaling and retailing problems in this vastly expanding industry long ago beckoned the assistance of data processing machines. And General Shoe has followed the developments in this field closely. The nearest they have come to the big “brains,” up until now is their Model “650,” presently in use in the Nashville main office. It has been installed since February, 1956. Anyone slightly

familiar with this machine can have some idea of the nature of the 705.

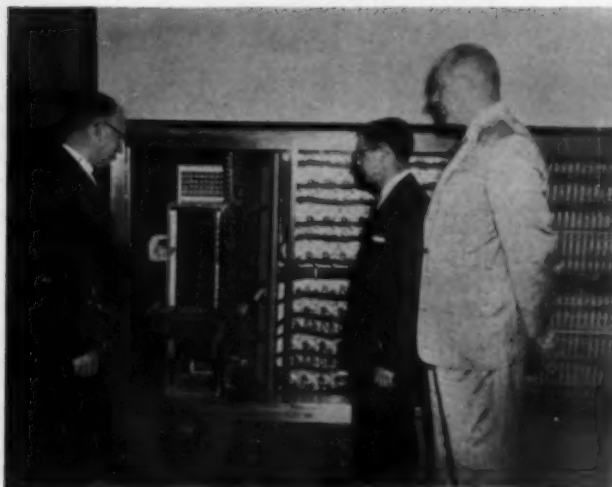
General Shoe has been satisfied to a degree with the 650, but after their long investigation of the capabilities of the 705, their satisfaction waned. The efficiency of the two machines actually varies as night and day. It is estimated that the 705 is over 10 times more effective than the 650 in the type of work it will handle and the problems it will solve. Since the 705 will perform jobs that have never been done before, new fields of employment will most likely be opened up in General Shoe.

This last is a point that is appealing to employer and employee alike. With this in mind, the “brain” loses its characteristic shape of a monster come to clean house of inefficiency and instead is looked upon as a welcome friend and helper by those most fully acquainted with its purposes.

This all sounds fine, but data processing equipment is not just







LEFT — Bill Brown points out an interesting aspect of the "heart" of the 705 or the Magnetic Core Memory to colleagues Doug Maddux and Hiram Harris.



RIGHT — General Shoe men directing preparation for the arrival of the 705 observe a problem being directed through the 705 at the "console" or control board. Doug Maddux, Hiram Harris and Bill Brown have done much of their observation and research of the 705 at the National Life and Accident Insurance Company installation, where this picture was made.

installed and told to go to work. Between now and delivery day to General Shoe of the largest "electronic brain" in the world for commercial use, there are many intricate steps to be worked out in preparation for its coming.

This phase of preparation for the future is, of course, "programming," or stating the problems and charting the course for the problem to be worked out. Even though the "brain" can add, subtract, multiply, divide and is equipped with a "memory" for storing up facts and figures, pulling them out in logical sequence, it can do all these things only if someone tells it exactly what to do.

It must be told where to start to work, where to find a figure, where to put it, where to add it to another. It's completely powerless to perform without people around to feed the information into it — people who understand its special "feeding" problems.

This is where the group under the guidance of Bill Brown, director of Administrative Methods and Procedures, comes into the picture. He and his staff of specialists gather the information,

analyze the problems and tell the 705 how they want them solved. The men working with Bill have backgrounds of varying degrees in General Shoe. This is purposeful as these men were hand-picked for their knowledge of their own departments and fields. Representing practically every facet of General Shoe's operation, they incorporate their ideas to develop the problems for the 705.

These specialists come from manufacturing, various sales divisions, accounting, purchasing, real estate, to name a few. The present staff is composed of (nearly all young executives in their twenties or thirties) Dick Wright, Joe Robinson, Cornell Watts, Wills Ogelsby, Marvin Wolfe, Joe McKinney, J. C. Murphy, Harold Henderson, Perkins Overton, Hiram Harris, Chuck McLafferty, Earl Hooper and Harry Daniels.

Each one is presently and will be constantly seeking ways in which the 705 can improve their operations. They are getting, too, the utmost in cooperation from other General Shoe employees in their efforts to gather mountains of data with which to work. They are also getting numerous sound suggestions from employees who

have taken quite an interest in the progress of this project.

The "brain" will certainly do its part. The speed and accuracy with which it operates is nothing short of fabulous. It will perform 8,400 additions or subtractions per second; 1,250 multiplications per second; 550 divisions per second; and make logical decisions at the rate of 29,400 per second.

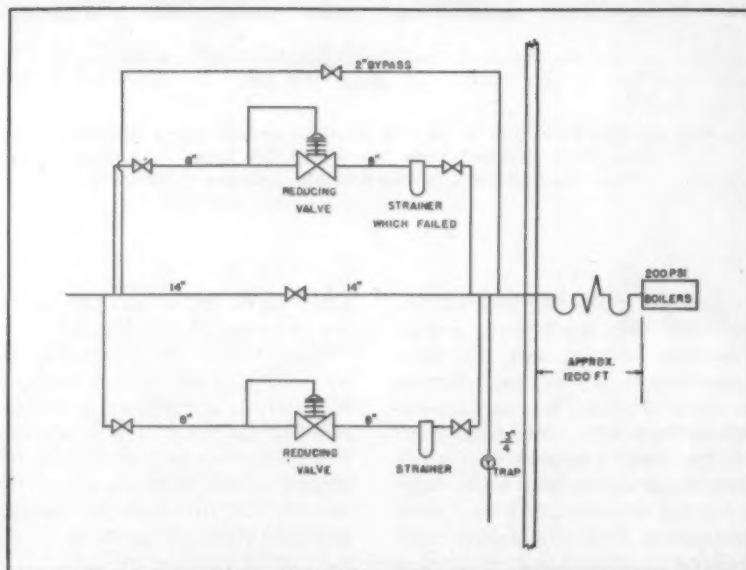
Despite these lightning-like calculations and other almost fantastic operations that will be turned over to the 705, it will be only a machine operated by people. It will, within its powers, help General Shoe to do a better job, a faster job. It will help every person on the company payroll and thus will help keep General Shoe in its place as the fastest growing shoe company in the world today.

The IBM 705 is an electronic friend to whose arrival every shoemaker and every employee in General Shoe should look forward. It will be a welcome "helper" to which can be tossed merciless tasks that humans are incapable of performing.

The editors of SPI are promised another article, a year or so from now, telling exactly what the 705 has accomplished for General Shoe.

No structural weakness . . .

## Engineers Believe WATER HAMMER CAUSED IT



**DANGER** of inadequate drainage as a cause of misoperation of valves on steam piping was recently demonstrated by a textile mill accident that killed two employees. The accident is believed to have been caused by water hammer.

Recommendations for action which should do much to lessen the possibility of steam line failures are contained in the following extract of an article which appeared in *The Condenser*, a publication of Mutual Boiler and Machinery Insurance Co.

An 8-in. cast iron strainer in the mill, forming part of a duplex reducing station, on a 200 psi steam line ruptured as shown below. This strainer was manufactured for 250 psi service and had been in use for approximately seven years. It was connected into the steam line from the boiler as shown in the sketch.

A 14-in. line ran from the boilers to the reducing station, a distance of approximately 1,200 ft. There were seven expansion loops in this line which had a pitch of about 1 in. per 100 ft.

The three drip legs, spaced about 225 to 250 ft apart, were connected to  $\frac{1}{2}$ -in. traps. In addition there was a  $\frac{1}{4}$ -in. trap inside the brick

Two workers were killed when this 8-in. strainer on a 200 psi steam line ruptured. Strainer had been connected into the steam line from the boiler as shown in diagram.

wall where the line dropped vertically to the reducing station. After the accident two of these traps were found to be 50 to 75% obstructed and the other two were completely plugged with deposits.

Prior to the accident the line had been out of service for plant repairs which included the installation of new diaphragms in the pressure reducing valves. While returning the line to service after a week-end shutdown and cutting in the reducing station, one of the cast iron strainers ruptured, fatally injuring two employees. The pressure on the main 14-in. steam line at the time was approximately 185 psi.

Since the traps were not functioning to full capacity and since there were no free blow drains connected to bottoms of the strainers, engineers concluded that a slug of water probably was carried along with the steam which partially or totally restricted the flow at the strainer, creating a shock wave or water hammer.

In addition to the rupture of one strainer, the top cover plate of one reducing valve fractured and the bottom plate of the other reducing valve was broken. The wooden partition enclosing the reducing station was bulged outward by the explosion. Two brick walls were also damaged by bulging and cracking and a hole was opened up in one wall.

The property damage and indirect loss amounted to over \$30,000. Part of the damage was caused by the opening of 50 sprinkler heads following the explosion. Over 2,175,000 yards of cloth was damaged.

Mutual Boiler's investigation revealed no structural weakness or defective material in the construction of the strainers and other parts of the reducing station.

### Recommendations

The effect of water hammer is one of the most perplexing problems which the plant engineer has to combat. Water hammer is usually manifest as a series of shocks sounding like hammer blows, but in some instances there is no noise even from waves of sufficient magnitude to rupture pipe or fittings. It may be caused by the nearly

instantaneous or too rapid closing of a valve in a line or by an equivalent stoppage of flow, such as a slug of water or condensate momentarily closing an opening or restricting flow through the opening.

Complete stoppage of flow is not necessary to produce water hammer, as any sudden change in velocity will create it to a greater or lesser degree, depending on the operating conditions at the time. Hence, with flow velocities of 25 to 50 ft per second, it is possible, under severe conditions, to set up shock pressures of 1500 to 3000 psi with correspondingly large energy blows or impact, which tend to tear the pipe or fittings apart.

The accident described here might not have occurred, if the lines had been properly drained and precautions taken to warm up the lines to remove all condensate.

Steam pipe accidents do not usually result in much damage to the piping itself. The greatest hazard is possible personal injuries and loss of life and the extensive damage that may follow the breakage of the piping. The escaping steam often wets down valuable goods in storage or process.

Mutual Boiler recommends that the following principles be brought to the attention of personnel responsible for placing steam lines and equipment in operation:

◆ All steam lines should be properly pitched and provided with

adequate drains, trapped or otherwise.

◆ Traps are usually intended for taking care of the condensate under normal operating conditions. However, if a line has been out of service for any prolonged period, the condensate should be removed by the use of open-end, free-blow drains. These open-end drains should blow to a sewer or the end of the drain should be visible to the operator so that he can determine when all of the condensate has been removed. This also applies after operating difficulties which might cause carryover of water into the steam lines or following unexpected shutdowns.

◆ Operators placing equipment or steam lines in or out of service should be properly trained regarding the opening and closing valves. They should know the importance of being certain that the lines are free of condensate or at least that all of the drain valves are open and functioning properly prior to admitting any large amount of steam into the line or equipment.

◆ In some instances condensate drain lines are equipped with strainers ahead of the traps. For the traps to operate at maximum capacity it is essential that the strainers be kept clean. The maintenance program should include periodic checking and cleaning of these strainers.

(Continued on Page 62)



Photo above shows how top cover plate of one reducing valve was fractured. Lines of fracture of the strainer can be seen in right photo.



Photos courtesy of Mutual Boiler and Machinery Insurance Co.

## Placing Steam Lines & Equipment in Operation?

(Recommendations for the plant engineer — continued)

◆ After a reducing valve has been out of service for a repair or to change a diaphragm, it is important that the person returning the reducing valve to service should understand thoroughly its operation. The pilot valve and any adjusting springs should be set to prevent the main valve from going to a wide-open position instantaneously because of a low pressure differential. The main valve should

be allowed to open slowly until the proper pressure differential is obtained.

◆ All pressure reducing stations should have adequate safety valve protection to prevent any low pressure equipment from being subjected to high pressure in case the main valve should go to a wide-open position. As there is always the possibility of the main valve

sticking, the recommendation also applies to reducing valves that fail safe.

◆ Care should be exercised in tightening bolts holding covering plates, bonnets, and other parts of cast iron fittings to avoid over-stressing. Excessive stressing can contribute to failure if the equipment is later subjected to vibration or shock. The use of torque wrenches in tightening the bolts of cast iron fittings is suggested.

Adoption of these practices should do much to lessen the possibility of steam line failures.

Use the right extinguisher . . .

## The ABC of Fires & Protection

**MOST** big fires start small. If you attack promptly with the right kind of "first aid" fire extinguisher (a portable or small mobile unit) you can put the fire out quickly and easily.

But the wrong kind of extinguisher may do more harm than good.

Each class of fire calls for specialized action. For your own protection, you should know the five basic types, how to use them, and why.

**CLASS A FIRES** — Paper, wood, cloth, excelsior, rubbish, etc., where quenching and cooling effect of water is required.

**Use Foam or Water** — Foam has both smothering and wetting action; water saturates material and prevents rekindles.

**CLASS B FIRES** — Burning liquids (gasoline, oils, paints, cooking fats, etc.), where smothering action is required.

**Carbon Dioxide, Dry Chemical or Foam** are overwhelmingly recommended. Vaporizing Liquid can be used.

Carbon dioxide leaves no residue, does not affect equipment or foodstuffs; dry chemical smother-

ers fire; foam gives smothering blanket which does not dissipate but floats on top of spilled liquids; vaporizing liquid forms heavy smothering gas.

**Never Use Water** — it will spread the fire, not put it out.

**CLASS C FIRES** — Fires in live electrical equipment (motors, switches, etc.), where a non-conducting extinguishing agent is required.

**Carbon Dioxide or Dry Chemical** are overwhelmingly recommended. Vaporizing Liquid can be used.

Carbon dioxide is a non-conductor, leaves no residue, will not damage equipment; dry chemical is also a non-conductor and screen of dry chemical shields operator from heat; vaporizing liquid is a non-conductor.

**Never Use Foam** — it is a conductor and should not be used on live electrical equipment.

Note: All fire extinguisher manufacturers who carry a complete line must include vaporizing liquid portables. However, the entire industry frowns on their use. In

an enclosed space they are extremely toxic — a ratio of 1000:1 to carbon dioxide. For Class B and C fires, the industry overwhelmingly recommends carbon dioxide or dry chemical.

This material has been adapted from "Positive Fire Protection," a new 12-page fire detecting-extinguishing equipment book by Walter Kidde & Company, Inc. Catalog features a full page chart "The ABC of Fires and Fire Protection" covering types of extinguishers and how to use them. For your free copy, ask for Catalog P-40, Dept. A, Walter Kidde & Company, Inc., Main St., Belleville 9, New Jersey.

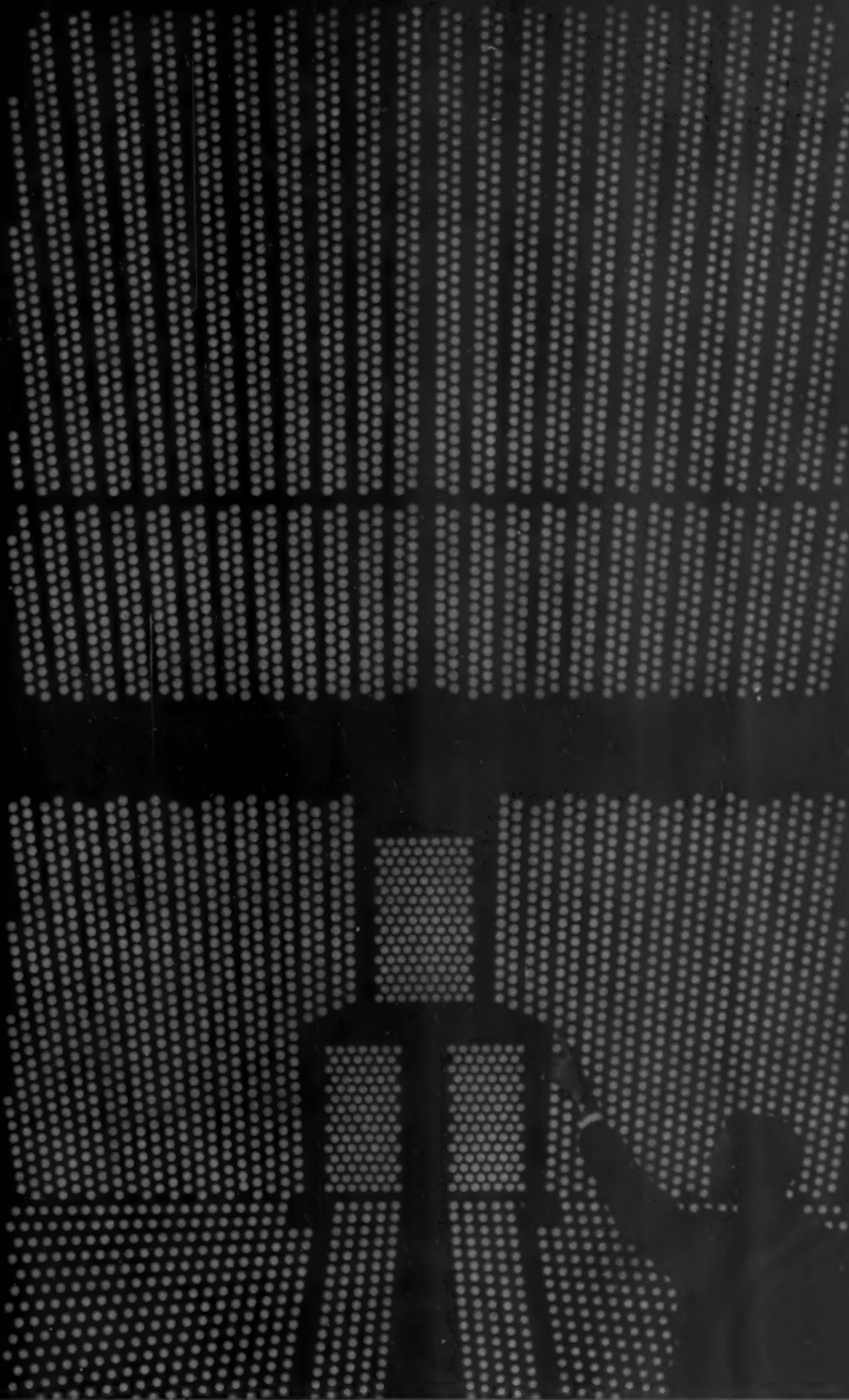
## Grating Handbook

**A NEW** "Metal Grating Handbook" will find wide application in a variety of industries by those who specify, buy, or use metal grating and treads.

The technical guide, prepared with the cooperation of eight leading grating and tread manufacturers, features drawings, tables, standards, specifications, installational views and a glossary of terms and definitions used throughout the industry.

The 32-page "Metal Grating Handbook" is available at \$1 per copy from Metal Grating Institute, Inc., One Gateway Center, Pittsburgh 22, Pa.





This is Marind's tube layout for one bank of a two-pass, divided-flow condenser designed to operate in conjunction with a 156 MW turbo-generator. Generous inter-tube laning; ample belt-steam area-way for reheat, steam distribution and de-aeration in the "hot well"; and a compact, efficient noncon-

densable gas cooling section . . . are all engineered to meet the needs of a particular turbo-generator. When your plans call for steam surface condensers, take advantage of Marind's many years of engineering experience and facilities for designing and producing condensers of any size.

**MARYLAND SHIPBUILDING & DRYDOCK COMPANY • Industrial Products Division**

Baltimore 3, Maryland • Representatives in Principal Cities

## WHY I LIKE MY SUPERVISOR

**THIS** could just as well be titled "Secrets of Success for Department Heads" but that would have called for high toned writing not in my line.

I like the man I work for because, first and foremost, he's a leader, not a driver. Three things about him are important to me. He has lots of patience, is a straight shooter and is always fair.

He's a patient teacher, showing me how to tackle a new job or how to do an old job better. He won't even let me start on a job 'til *he knows* I know what to do and how to do it. He's a patient listener to my complaints big or small. He'll take great pains to answer questions I have about the work. If he doesn't know the answer he'll say so, but you can bet he'll get the answer pronto. He hears me out on suggestions I make even though he may not think much of any of mine. He knows that this way sooner or later he'll get a good one.

That man goes all out in making clear to me what's to be done, when to do it, how to do it and, this is what I like, he tells me why it must be done. Seems I always can do a job better if I know the why of it.

Another thing about his patience — when I make a mistake, instead of flying off the handle, he shows me how and why it happened and how to keep it from happening again. I get the impression, too, that it had better not happen again.

Now about his being honest. He never makes any promises he's not sure of keeping. If he says I'll get a raise come January 1, I'll get it. I may not like everything he tells me but, at least, I can count on it because of his straight shooting. He knows the contract backwards and forwards and lives up to it, all of which goes to make the grievance committee's job easy.

The day I started working here, he let me know for sure that he was expecting the same honesty from me as I'd get from him. When I don't do my work right he knows whether to go easy on me or crack down. However, the cracking down part of it he does in private without raising his voice and that I'm thankful for.

He plays no favorites and that would go for the President's son if he worked here. Without being able to prove it, I feel he'd never ask any man to do a job he wouldn't do himself.

If he thinks I'm not getting a fair shake pay-wise, he goes to bat for me. He'll back me against anybody once he's convinced I'm right. When I do a job especially well he never forgets to give me full credit.

Because he's a good planner we have all the tools and material we need on time. It's not often we have to really strain to meet a deadline . . . not if he can help it. He seldom waits 'til Friday evening to tell me I should work on Saturday. He has a way with us fellows of getting us to raise our sights and like it. He lets us know that what we're doing is important. I like that and, what's more, I find myself, for no special reason, scheming out ways of doing my job so as to please him.

He sure sets us a good example when it comes to knowing his job and doing it well. I can't help feeling, from what he says and how he acts, that he's really interested in seeing me get along in this organization — leastwise not get into a rut. He answers for us the question "How are we doing?" because he knows the score and lets us in on it.

To wrap it up, let's say, "Because of that man, I'm glad I work here."

By **WILLIAM H. ALLGEIER**, Helena, Ark.

## Aircraft & Missile Industry

*Southern Boom — Starts Page 47*

Texas, Phillips Petroleum is developing a powerful solid rocket fuel.

Top facility for the study of the effect of climatic conditions on aircraft is located at Eglin Air Force Base near Pensacola, Florida while the Kelley Air Force Base in Texas and the Navy's air base at Pensacola are the centers of pioneering aero-medical investigations. Supple-

menting the work of Federal research groups and private industry are a great number of alert and aggressive educational and research institutions throughout the South.

Aviation, which was born in the South, promises to find its most fertile soil for development and expansion in the South. With a most favorable climate, ample space for plant dispersion, a skilled labor force and a record of aggressive development, the South is certain to enjoy an important share of the huge expansion of the aircraft and missile industry.

# COLOR-PORT

## water level gage

gives you . . . two-color readings  
. . . low maintenance  
. . . increased availability

▼  
You get a *triple advantage* with the Yarway COLOR-PORT boiler water level gage for pressures to 3000 psi.

*Two-color readings* are brilliant and clear. Water shows green; steam shows red. A full gage is all green and an empty gage all red.

*Low maintenance* with individual cover-glass assemblies, each held solidly in place by four socket head cap screws. "Floating assembly" design applies safe, predetermined loads on glass ports, reducing thermal shocks, permitting faster warm-up.

*Increased availability* means longer service life. Cover glass assemblies can be serviced *in place*, easily and quickly.



Yarway Bulletin WG-1814 describes the Color-Port Gage. Write for it.

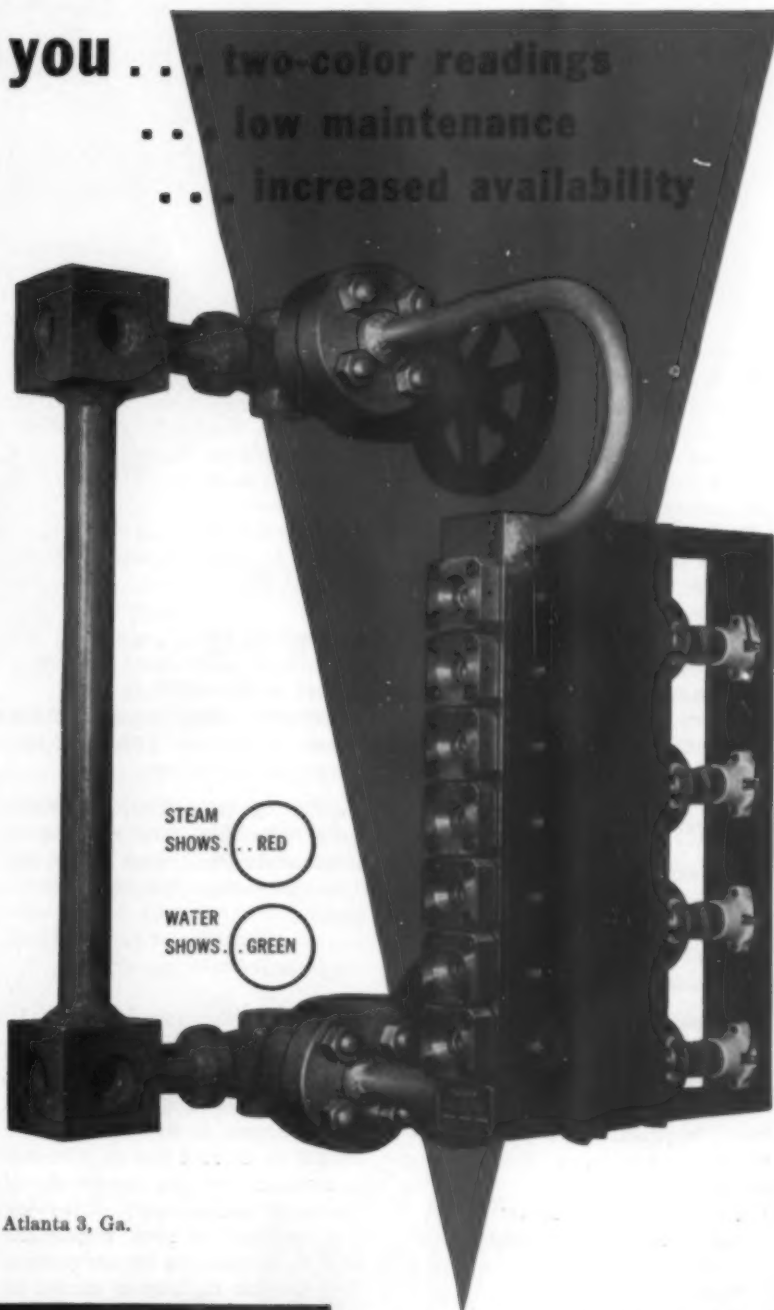
### YARNALL-WARING COMPANY

Home Office: 116 Mermaid Ave.

Philadelphia 18, Pa.

Southern Representative:

ROGER A. MARTIN, Bona Allen Bldg., Atlanta 3, Ga.



STEAM  
SHOWS . . . RED

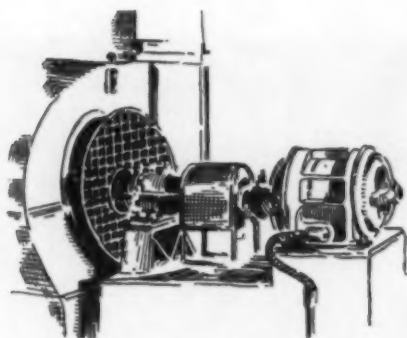
WATER  
SHOWS . . . GREEN

# YARWAY

## COLOR-PORT

... a good way to specify  
high pressure water gages

# Preventive Maintenance — Motors



**THE MOST** effective maintenance program is one that stresses prevention of troubles rather than their repair. This is particularly true of the induction motor, which not-with-standing its simplicity, is a basic component in many important and intricate production processes, where heavy financial losses may be incurred if the motor is disabled even momentarily.

A preventive maintenance program must be based upon regular observations and checking of the parts which experience has shown to be most affected by adverse conditions prevailing around the installation.

## Causes of Motor Failures

General experience shows that the most common field troubles may be grouped in three almost equal categories:

- a. Bearing troubles
- b. Winding troubles
- c. All others

The principal adverse conditions found in practice and their effects on the various parts of the motor are as follows:

1. *Dirt or dust:* These are damaging to the bearings and insulation, and may also hamper ventilation and heat dissipation, causing winding failures. Vibration may also result from dirt causing unbalance in the rotating parts.
2. *High ambient temperature:* Af-

fects the lubricant, the bearings and the insulation.

3. *Moisture and corrosive atmosphere:* Tends to rust and corrode all parts of the motor and may destroy the lubricant.
4. *Poor lubrication:* Is responsible for friction and heat in the bearings; this may cause additional heat in the windings.
5. *Overload:* May overload the bearings and cause excessive heat in the windings.
6. *Vibration:* May cause mechanical or electrical failure in any part of the motor.

Some of the adversities mentioned may readily be reduced or eliminated—there is no excuse for poor lubrication or constant overloading. Other factors such as corrosive atmosphere or high ambient temperature may be inherent.

## Inspection and Records

Although modern Ball Bearing Motors require very little attention in service, a thorough inspection program of the entire motor should be carried out at intervals determined by the conditions of operation and severity of service. The findings of such inspections should be recorded for comparison with similar findings at earlier or later inspections. Progressive deterioration in any given part under conditions at hand can thus be obtained from experience and thereby a most effective and economic

Enemies of Performance . . . . .	
Dust and Dirt . . . . .	
High Temperature . . . . .	
Moisture and Corrosion . . . . .	
Poor Lubrication . . . . .	
Overload . . . . .	
Vibration . . . . .	

preventive maintenance program be established. Complete records of deterioration and wear will be found very helpful in planning for the spare parts to be carried for a given number of units in operation.

Routine servicing, such as regular periodic oiling or greasing of the bearings, are not necessarily recorded but the person charged with these important duties should be instructed and encouraged to observe other significant factors, which may be worth recording. He can, for example, check strange noises and determine their type and where they originate. He can check if the motor shows abnormal temperature, either by the feel of the hand on the frame or by the characteristic odor of overheated insulation. Excessive vibration may easily be detected by the feel of the hand and may be diagnosed as due to tight or worn belts, loose foundation bolts or perhaps due only to a loose set screw in the hub of a pulley.

The oiler should also be instructed to wipe up any oil that is spilled in oiling; this will make it easier to detect slow and continuous leaks through bearing seals or oil fittings. *Cleanliness in general should be stressed* since cumulation of dust and dirt around bearings and ventilation openings may cause bearing and insulation failures.

Abstracted from *Maintenance News*,  
Published by Westinghouse.





**Pay dirt!**  
**...year after year!**



**BUELL  
CYCLONE**



**"SF" ELECTRIC  
PRECIPITATOR**



**PRECIPITATOR-CYCLONE  
COMBINATION**

Buell Cyclone collectors pay off two ways: extra efficiency from the start . . . and extra years of operation, with little if any maintenance. Unique features like Buell's exclusive Shave-off deliver an extra percentage of dust collection efficiency: in nearly all cases, Buell installations pay for themselves in just a few years. And heavy plate construction, scientific proportioning, side entry of dust-laden gases are reasons why

they keep on earning for many, many years. For specific details, write for "The Collection and Recovery of Industrial Dusts". Just write Dept. 80-D, Buell Engineering Company, Inc., 138 Williams Street, N. Y. 38, N. Y.



**buell**

*Experts at delivering Extra Efficiency in* **DUST COLLECTION SYSTEMS**



The canopy valued at \$20,000, is packed for shipment at an over-all crating cost of \$15.00. Three sisal hold-down straps are nailed to the prefabricated base of the crate.

## Georgia Aircraft Plant Cuts Crating Cost 60%

# How to Package Bulky Products

**LOCKHEED AIRCRAFT** Corp. proves every day at its Marietta, Ga., plant, the world's largest roofed acreage, that high-value bulky products can be packed safely, quickly and economically for shipment.

Plastic cockpit canopies valued up to \$20,000 and bulky and odd shaped airplane fuel cells are packed for shipment to USAF depots after being removed from planes flown in for major modification.

Both products used to be packed in containers made by the company's shipping department and assembled by packers. Now they are packed in specially engineered and wholly prefabricated wirebound crates with these impressive results:

Over-all packing costs for B-47

Stratojet plastic canopy cut \$29.66, or over 65%, from \$44.66 to \$15 and over-all packing costs for a typical B-47 fuel cell reduced by \$26.81, or over 60%, from \$40.48 to \$13.67.

The wirebound crates used for the B-47 canopies and fuel cells are of special engineering designs because of the extraordinary bulkiness of the objects, a canopy being over 12 ft long and a fuel cell over 11 ft long.

The crate for a canopy consists of a specially designed built-up base, the top, and four two-section wirebound blanks that are wrapped around the base and joined to each other with twisted wire closures to form the four sides of the container. Two three-section wirebound blanks wrapped around the specially designed base and joined

to each other form the sides of the crate for the B-47 fuel cell.

The wirebound crate used to pack a canopy has the same dimensions as the old style nailed wood crate, but it weighs only 132 lb, or 117 lb less than the 319 lb former crate. That used for the fuel cell is also identical in dimensions with the crate formerly used, but it has cut tare weight from 252 to 178 lb.

Three sisal hold-down straps, one longitudinal and the others cross-wise, nailed to the base of the crate constitute the only special interior packing needed in packing a \$20,000 B-47 plastic canopy. No special interior packing or blocking is needed for the fuel cell, it simply being placed in position on the base of its crate at the start of packing.



## About the Cost of Living...with Steam Traps

WHEN YOU specify steam traps, what could possibly be more important than the cost of living with them—production cost... steam cost... downtime cost... repair cost.

No steam traps manufactured have ever provided greater equipment operating efficiency or lower trap maintenance cost than Armstrongs.

Consider the experiences of these companies:

**"30% Greater Output** from platen presses since installing Armstrong Traps"—rubber processor.

**"\$8000 Annual Fuel Saving** since replacing 600 traps with Armstrong"—metal processor.

**"30% Less Downtime** for repairs with Armstrong Traps"—food processor.

**"\$25,000 Trap Maintenance Saving** every year since installing 4000 Armstrong Traps"—major chemical plant.

You may well ask, "Can there really be so big a difference in steam trap performance?" The answer is: These are typical experiences of people who have compared Armstrong trap performance—not for a month or a year, but over periods of 2, 5 and even 10 years or more.

The Armstrong trap has certain fundamental advantages, including:

**No Steam Loss**—the valve is always water-sealed.

**Large air-venting capacity**—air is automatically discharged along with condensate.

**Long-life parts**—hardened chrome steel valve and seat—all other parts corrosion-resistant stainless. Absor-

lutely nothing to stick, bind, clog or collapse. Not affected by ordinary dirt and scale.

**Unconditionally guaranteed to satisfy.** It takes an awfully good product to carry such a guarantee.

Steam traps can have such a big effect on plant operating efficiency, they are worth more than casual consideration. Let your Armstrong Factory Representative answer your questions. There is no obligation. Call him or write:

**ARMSTRONG MACHINE WORKS**  
8062 Maple Street • Three Rivers, Mich.



Do you have "The Steam Trap Book"?  
—44 pages of useful data on trap sizing, calculation of condensate loads, installation and maintenance. Free on request.

# ARMSTRONG STEAM TRAPS

## Efficient Use of Waste Gas

**By R. E. THIESEN, Production Assistant**

**Utilities Department, Union Carbide and Chemicals Co., Texas City, Tex.**

**A STEAM** plant erected at a

Texas Chemical Plant was designed to burn low heating value waste gas. This waste gas ranged normally from 410 Btu per cu ft to 520 Btu per cu ft and at times changed rather abruptly over a wider range. This waste gas and a constant heating value fuel (900 Btu per cu ft) were tied together into a common mixed fuel header to the steam plant (Fig. 1). The CHV fuel was used as make-up and had a pressure operated motor valve which held 55 psi on the mixed fuel header to the steam plant (Fig. 1).

The original fuel gas control system controlled a fixed ratio of waste gas flow to CHV fuel flow with a ratio controller which fed its output to a motor valve in the waste line. Regardless of how abruptly the waste gas heating value changed, the pre-set flow ratio remained the same which

consequently played havoc with the boiler fuel-air ratio. The excess air on occasions dropped to 0% due to radical heating value changes.

The evident problem involved was to design a control system that would hold the calorific value reasonably constant in the mixed fuel flow to the steam plant.

To solve this problem a Wobbe index recorder with an internal transmitter was installed on the mixed fuel line to the steam plant. The Wobbe index recorder is merely a converted recording calorimeter which when converted records the unit function of calorific value and specific gravity of the fuel.

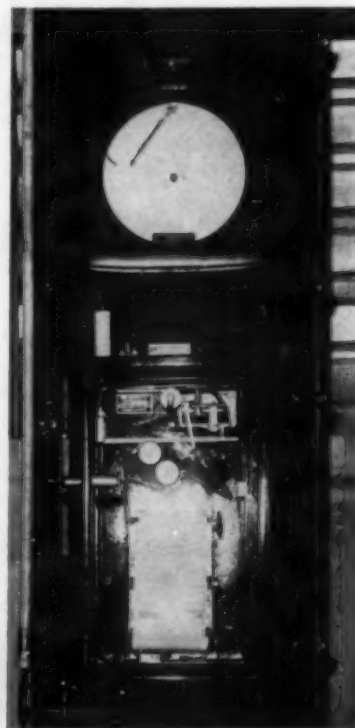
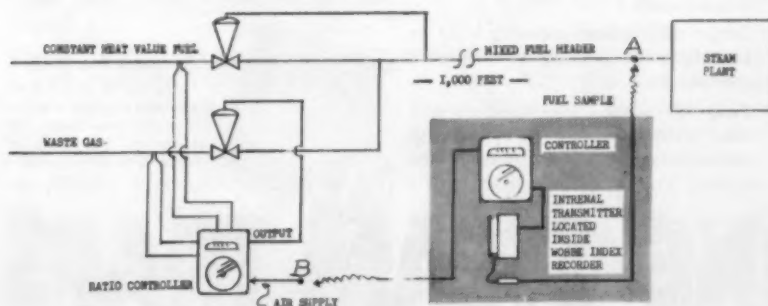
$$\text{Wobbe Index} = (\text{Cal. Val.}) \div (\text{Sp Gr})^{1/2}$$

This recorded Wobbe index is sent by the internal transmitter to a controller. The output of the controller is connected to the air supply tap on the original ratio

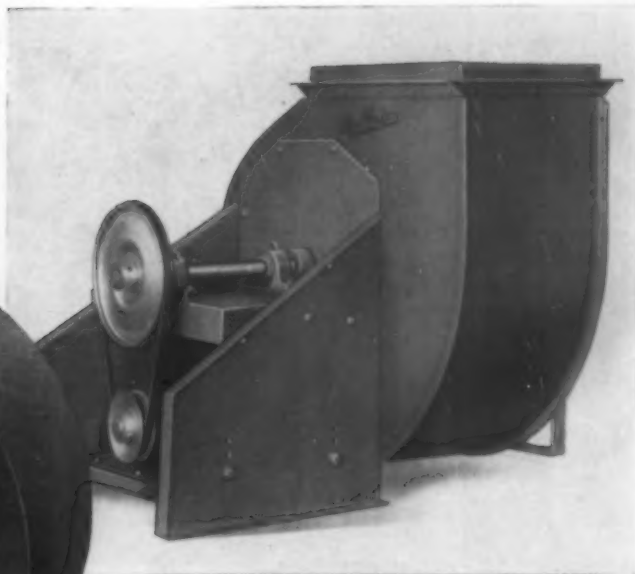
controller. As the Wobbe index changes, the output of the controller changes, which changes the setting on the original ratio controller, and consequently varies the waste gas flow according to its heat content. The index pen on the controller sets the desired Wobbe index which holds the fuel to the boiler at the desired heating value.

The Wobbe index recorder through the use of the controller holds the heating value within a reasonable operating limit of plus or minus 20 Btu of its setting. Also, since the controlling element is now located in the steam plant, the steam plant operators have control of the fuel heating value which formerly rested with another department.

The new equipment in the shaded area was connected to the original installation at A and B. The photograph shows the Wobbe index recorder with an internal transmitter and a controller mounted above.







## TROUBLE-FREE VENTILATION, MATERIALS MOVING WITH THESE RELIABLE 'BUFFALO' PACKAGE FANS

### 'BUFFALO' INDUSTRIAL EXHAUSTERS

"Buffalo" Industrial Exhausters are available in a wide variety of models, capacities and arrangements to handle your most demanding air or material handling jobs with the utmost efficiency and dependability. The heavy welded steel plate housing is adjustable to any desired direction of discharge. Ease of maintenance is assured by the removable front and back plates. The several arrangements in the line include both belted and direct-connected drives. The 8-bladed, all-welded air wheel effectively exhausts hot air, gases, fumes and light dust. Corrosion-resistant construction can be specified. Two types of material wheels cover all exhausting requirements, from emery dust, sawdust, paper, and chips to long shavings and other stringy substances. Capacities range from 600 to 37,000 cfm.

There's a rugged, reliable "Buffalo" Industrial Exhauster to fit most air or material handling requirements. Call in your "Buffalo" Representative, or write for full information in Bulletin 3576-B.

*Every "Buffalo" product features the famous "Q" Factor—the built-in QUALITY that provides trouble-free satisfaction and long life.*

### BUFFALO FORGE COMPANY BUFFALO, N. Y.

Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING	AIR CLEANING	AIR TEMPERING	INDUCED DRAFT	EXHAUSTING
FORCED DRAFT	COOLING	HEATING	PRESSURE BLOWING	

### 'BUFFALO' BELTED VENT SETS

Where low initial and operating costs are important... where a quiet fan is necessary... where a "package" unit is desirable... more and more industrial users are turning to "Buffalo" Belted Vent Sets. These versatile units are especially adaptable to smaller system requirements, or for use when central system ventilation requires augmentation. They offer quiet, stable performance, high efficiencies and the non-overloading characteristics of the largest "Buffalo" Fans. A lightweight package, they can be quickly and easily installed indoors, outdoors or as power roof ventilators. Available in capacities from 500 to 20,000 cfm (capacity can be modified at any time by changing motor or fan pulleys).

"Buffalo" Belted Vent Sets may be the economical answer to *your* smaller system ventilation needs. Contact your nearest "Buffalo" Engineering Representative, or write for Bulletin 3720-A.



# ***"We cut Electrical Installation Costs and got better protection . . . by installing Fusetron Fuses throughout our New Dairy Plant!"***

**William J. Oyala**  
ELECTRICAL SUPERVISOR  
Fred Meyer Co. Portland, Oregon

*Mr. Oyala continues . . .*

"In our new dairy plant in Portland, Fusetron dual-element fuses saved us about \$800 by enabling us to use the proper switch sizes for the motor disconnects. This was possible because the long time-lag of Fusetron fuses permitted us to install them in smaller sizes than would have been possible with ordinary fuses.

"In addition, we were able to reduce the space required by the control centers.

"The Fusetron fuses were installed in sizes small enough to give us motor-running protection as well as motor branch circuit protection.

"The result of this has been the prevention of motor burnouts. Not once in the past year of operation has a Fusetron fuse failed to protect a motor. We have 138 motors, ranging from 1/40 H.P. to 100 H.P., and all are protected by Fusetron fuses.

"Both Mr. Eric Christenson, whose company contracted the electrical work, and myself believe that by installing Fusetron fuses throughout our entire plant we got top protection at a cost lower than could have been obtained by any other method."

## **FUSETRON DUAL-ELEMENT FUSES PROVIDE SAFER, MORE DEPENDABLE PROTECTION**

Only Fusetron fuses provide 10 point protection—not possible with any other type of protective device.

Thus, wherever a Fusetron fuse is installed you have safety as sure and dependable as you can buy—no matter what you pay.

### **AND FUSETRON FUSES REMAIN SAFE THROUGH THE YEARS . . . NO MAINTENANCE COSTS**

Once properly installed Fusetron fuses are maintenance free. They require no costly inspection or downtime for calibration and other maintenance necessary on mechanically operated devices.

Dust, fumes, corrosion or age cannot prevent a Fusetron fuse from opening safely. There are no hinges, pivots or contacts to stick or slow down the operation of the fuse on short-circuit.

### **NO RECALIBRATION COSTS**

When a Fusetron dual-element fuse does blow, there is no recalibration needed. As quickly as the fault in the circuit is corrected, you slip in a new fuse. The new Fusetron fuse is just as it came from the factory—accurately calibrated—and ready to give the same safe, dependable, coordinated protection as did the one it replaced.

### **FOR LOADS ABOVE 600 AMPS.—USE BUSS HI-CAP FUSES to coordinate with FUSETRON Fuses.**

On 600 volts or less, BUSS Hi-Cap fuses have an interrupting capacity sufficient to handle any fault current regardless of system growth.

They can be coordinated with Fusetron fuses on feeder and branch circuits to limit fault outage to circuits of origin.

**Write for bulletin HCS.**

**For more information on FUSETRON dual-element Fuses . . . Write for bulletin FIS.**

**BUSSMANN MFG. DIVISION** McGraw-Edison Co.  
University at Jefferson, St. Louis 7, Mo.



**WILLIAM J. OYALA**  
Electrical Supervisor  
FRED MEYER CO.

**ERIC CHRISTENSON, Owner**  
CHRISTENSON ELECTRIC CO.  
PORTLAND, ORE.

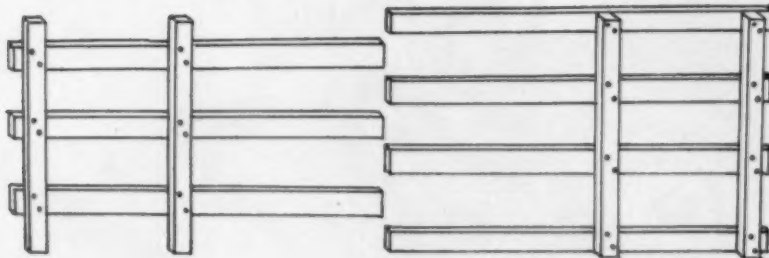
***Play Safe! Install Fusetron dual-element fuses and BUSS Hi-Cap  
Fuses throughout entire Electrical System!***



## Adjustable Divider for Shipments

**TEXAS** Vitrified Pipe Company of Mineral Wells, Texas, was plagued with a problem perhaps common to many industries shipping by rail or motor truck. They needed to prepare in advance, gates to be used in separating parts of loads in varying widths of rail cars and trucks.

As all shippers know, rail cars vary as much as a foot in width. We were prompted because of this variation to make adjustable gates which we use as bulk heads to hold the two half loadings of a rail car apart at the doors and against the ends of the car. More recently, we used the same device



with differing dimensions as tail gates for over the road trucks.

Each half of the gate was made with two standards and with wide-spread horizontal slats. The gate is designed so the two halves slide together much as the fingers of your two hands when they are placed on a table top and the one hand advanced into the other with the fingers apart. When upon assembly the desired length gate is attained, the slats of each half are nailed to the standards of the other half, forming a gate with

four standards and as many slats as desired.

This gate is very flexible in its use. It may be used with steel banding in anchoring loads in cars or in forming packages. It may also be used with chains and load binders for varying lengths of loads in over road trucks. The slats and stakes as well as all design dimensions may vary as necessary for different needs.

By **LUTHER WADDY**, Chief Engineer, Texas Vitrified Pipe Company, Mineral Wells, Texas

## Convenient Tool for Special Jobs

**ALL TUBE-TURN** welding fittings manufactured by Tube Turns, Louisville, Ky. — a division of National Cylinder Gas Company, Chicago — must pass through thirty-two inspection stations during the manufacturing process. At each of these stations they are closely examined by inspectors who not only have been

trained for their exacting tasks, but who also take justifiable pride in contributing to the success of the plant's rigid quality control program.

The inspectors make their product evaluations with the aid of industry's most modern analytical equipment. For instance, a variety of standard and special gauges are

employed in controlling the dimensions of fittings and flanges during the forging and finishing operations. Every eight hours the readings of these instruments are reviewed for accuracy and they are often checked with Johansson type steel blocks and by other means.

Among the inspection instruments used exclusively by Tube Turns is a deep throat micrometer of improved design — see photo. It consists of a conventional micrometer fitted into the head of an aluminum shape that permits the checking of the inner and outer arcs of 45° and 90° elbows and 180° returns, including the so-called "blind" areas. Thus the wall thickness at all points is readily determined.

The plant also has an instrument laboratory where gauges are built, modified and repaired, as needed to meet the requirements of the quality control program.



**USE SPI  
READER SERVICE**

**See Pages 97-98**





## Reduce "Manufacturing Overhead" ...by Going Overhead with **AMERICAN MONORAIL**

**R**educe indirect mfg. costs  
**E**liminate re-handling  
**D**amage to floors eliminated  
**U**tilize larger production units  
**C**ontrol work flow  
**E**xpedite production

**M**inimize employee fatigue  
**F**ull use of plant cubage  
**G**ain full use of floor space

**C**ut "down time"  
**O**vercome floor hindrance  
**S**ecure flexibility in material movement  
**T**ransfer loads without re-handling  
**S**afety for the employee

An American MonoRail system will bring a quick reduction in manufacturing costs because it can do all the things listed at the left.

Overhead handling puts your ceiling space to work—leaves your floor free of traffic—helps you produce more efficiently in less space.

American MonoRail engineering consultants are available without obligation for the solution of your handling problems.

Write for Bulletin C-1 illustrating hundreds of successful MonoRail installations.



ENGINEERED MATERIALS HANDLING

13105 ATHENS AVENUE  
CLEVELAND 7, OHIO



# AMERICAN MONORAIL

MEMBER OF MATERIAL HANDLING INSTITUTE AND MONORAIL MANUFACTURERS ASSOCIATION

# PRIZE WINNING RILEY BOILERS

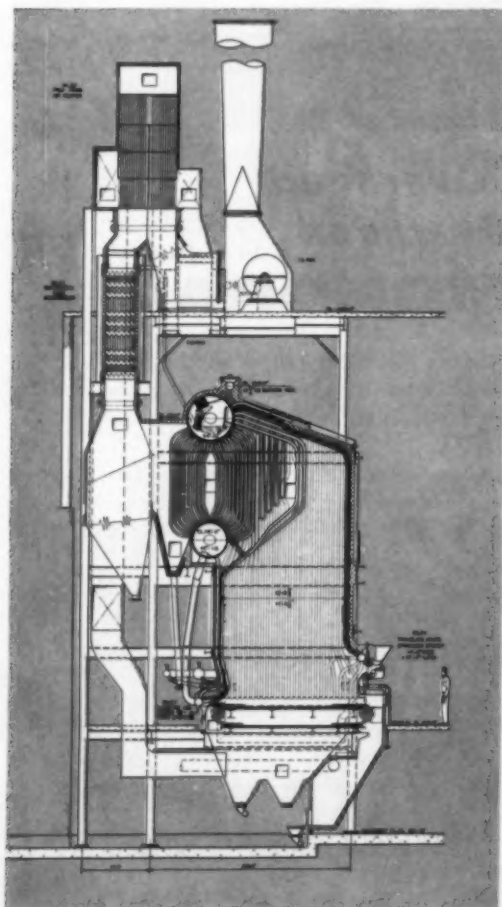
These Riley Boilers played important roles in winning awards for outstanding modernization of steam generating facilities in national contests conducted in recent years by a prominent publisher for the power industry. Each design was required to meet exacting specifications for size and arrangement in order to fit into restricted building space. Each has produced high fuel economies and high boiler efficiencies to earn at least a 20% annual return on the original investment.

Hundreds of Riley industrial boiler installations are also paying similar bonus dividends in

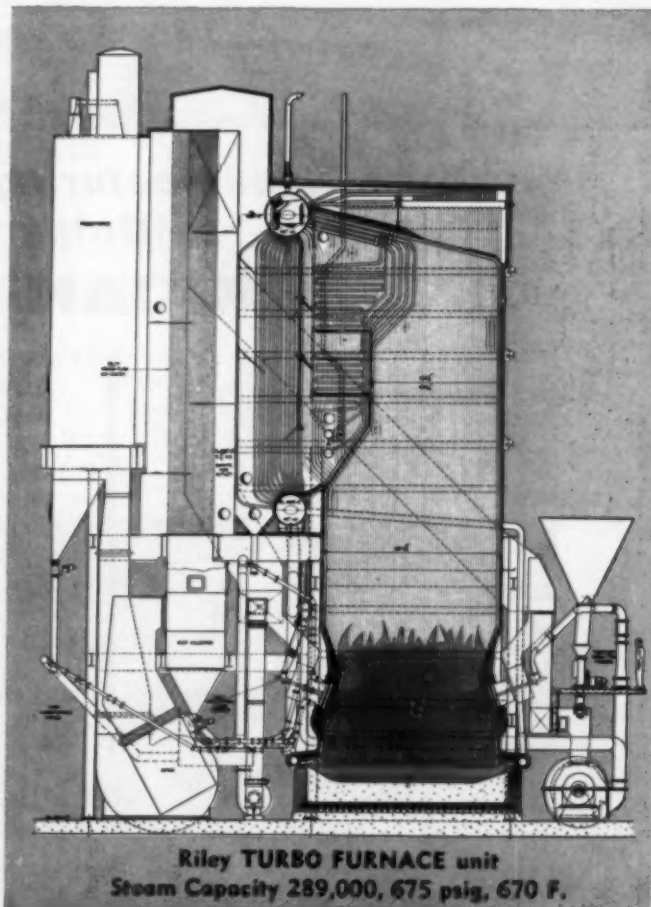
yearly net efficiency, dependability and in continuous, uninterrupted operation.

New additions to engineering facilities at Worcester and expanded production facilities at Riley's Pennsylvania plant will now speed delivery of Riley industrial type boilers from 50,000 lbs/hr and up. *Riley Stoker Corporation, Worcester, Mass.*

Representatives in Buffalo, Chicago, Cleveland, Detroit, New Orleans, New York, Philadelphia, Pittsburgh, Atlanta, Charlotte, Cincinnati, Houston, Kansas City, Los Angeles, Portland, St. Louis, St. Paul, Salt Lake City, San Francisco and Seattle.

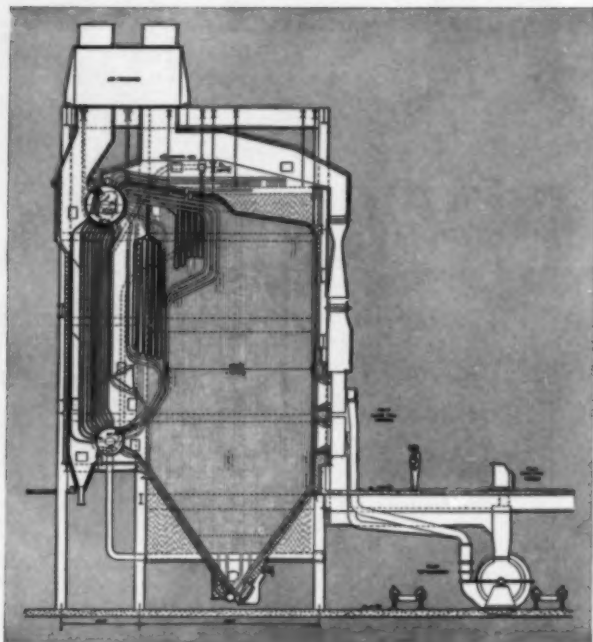


**Garlock Packing Co., Palmyra, New York**  
100,000 lbs/hr Riley Single Pass Boiler Fired by Riley Traveling Grate Spreader Stoker. 425 psig., 600 F. Cinder Reinjection.

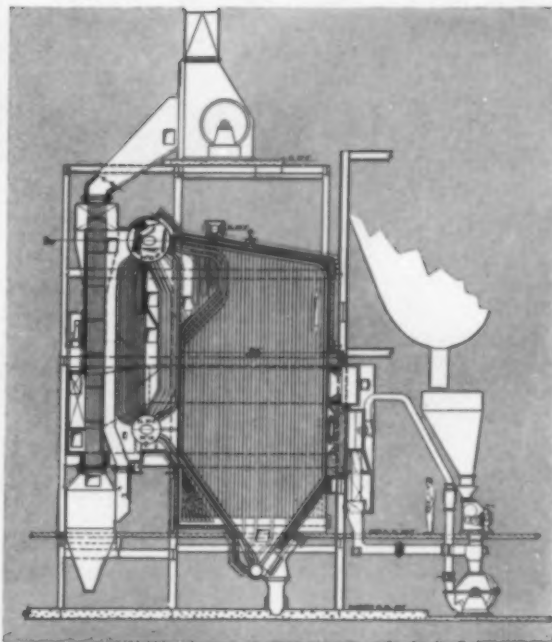


**Riley TURBO FURNACE unit**  
Steam Capacity 289,000, 675 psig, 670 F.

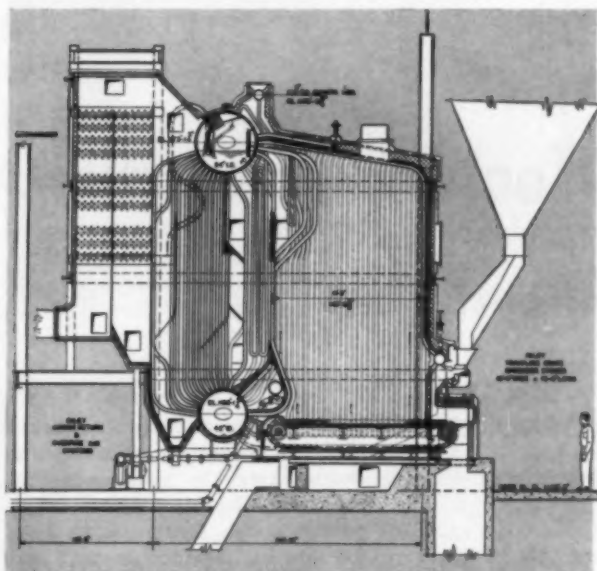
**Premier West Virginia Chemical Company**  
Replaces several low capacity, low efficiency units. Flyash reinjection eliminates flyash disposal problem, reduces carbon loss to minimum. Slag blowers not required.



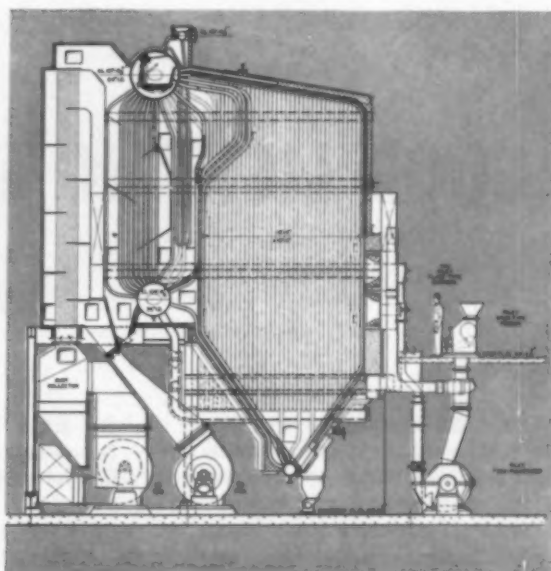
**Western Electric Co., Hawthorne Power Plant**  
Three 200,000 lbs/hr Riley Boilers fired by Riley Pulverizers, Riley Gas, Oil, Coal Burners, Single Header Hopper, 1000 psig, 835 F.



**Flinthote Company, Ridgely Park, N. J.**  
One 60,000 lbs/hr Riley Boiler fired by Riley Pulverizer, Burners, Riley Air Heater, Single Header Hopper. 200 psig, 477 F.



**Pennsylvania Railroad — Juniata Shops**  
Three 60,000 lbs/hr Riley Boilers fired by Riley Traveling Grate Spreader Stokers, 600 psig, 675 F. Riley Economizer. Cinder Reinjection.



**Thomas A. Edison Industries, West Orange, N. J.**  
Two 60,000 lbs/hr Riley Boilers fired by Riley Pulverizers, Burners, 450 psig, 515 F. Patented Riley Hopper Bottom. Riley Air-Heaters.

*A survey of your plant by a qualified consulting engineer could show ways of making surprising savings in your power costs.*



# RILEY

**STEAM GENERATING & FUEL BURNING EQUIPMENT**



Before — The inadequate lighting system formerly used in the Southern Engineering Company plant at Charlotte, N. C. provided poor seeing conditions inviting accidents.



After — Color-improved mercury reflector lamps providing 39 foot-candles throughout the area. Because workers can see better, opportunities for accidents are minimized.

## GOOD LIGHTING a Tool for Production

### *PART 8 — Good Lighting and Safety*

**DARKNESS** is a hazard. When we realize that 78% of our bodily reactions are directed by the sense of sight, according to psychologists, it is apparent that many accidents are caused by poor seeing. The National Safety Council estimates that 15 to 25% of industrial accidents are attributable to poor lighting which hampers seeing.

Since normal visual efficiency involves both the eyes and lighting, it is important that the eyes of workers, as well as the lighting, be functioning as near normal as possible.

Some plants have facilities located in the plant for periodic

**By ROY A. PALMER**  
Duke Power Company  
Charlotte, North Carolina

eye examination of workers; others, schedule regular visits for employees to the eye specialists' office. This serves as a precaution against poor seeing even where good lighting is provided, for a defective eye will give defective vision under any conditions of illumination.

Progress in ophthalmology has revealed that organic disorders are definitely linked to eye strain. Physicians tell us that chronic headaches, stomach upsets, nervous

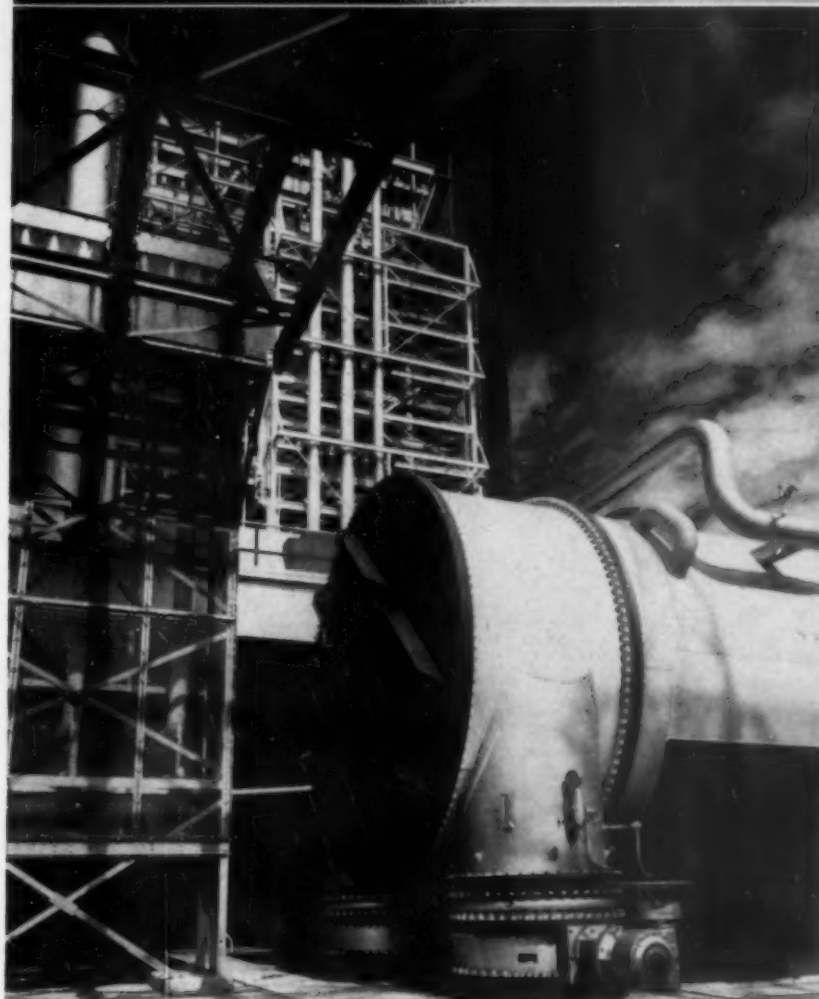
tension and even more serious ailments often can be attributed to overworking the eyes under insufficient illumination or aggravating glare. Therefore, to keep the human machine in top performing condition, the two partners — good vision and good lighting — are of utmost importance. Good seeing increases production, decreases spoilage and seconds, improves employee morale, and decreases accidents.

#### **Insufficient Light**

When one enters a movie theater from the brightly lighted entrance, it is difficult to see clearly enough to find a vacant seat. It



## PROGRESS IN POWER **through** PROGRESS IN HEAT TRANSFER EQUIPMENT



**LARGE  
CONDENSERS  
PRODUCED  
BY YUBA  
DESIGN ABILITY**

*Consulting Engineers—Ebasco Services Inc.*

As the demand for larger turbines continues, Yuba keeps step with progress by furnishing surface condensers of ever increasing size and efficiency.

Here is one of two 45,000 sq. ft. condenser sections designed and built for the Collin Generating Station of the Texas Power & Light Co. The two sections connected to a single turbine exhaust by a T-piece have a total surface of 90,000 sq. ft.

Yuba has designed and built condensers with 165,000 sq. ft. of surface. The designs of these large condensers can be adapted to condensers of even greater capacity as required for larger turbines.

In the design of surface condensers, Yuba incorporates such features as low-pressure heaters and complete de-aeration facilities within the condenser shells, thereby saving costly plant space and piping.

### **YUBA HEAT TRANSFER DIVISION**

HONESDALE, PENNSYLVANIA  
NEW YORK SALES OFFICE: 530 FIFTH AVENUE  
REPRESENTATIVES IN PRINCIPAL CITIES

#### *Other Yuba Divisions*

Adco Division, Buffalo, N. Y.  
California Steel Products Division, Richmond, Calif.  
Yuba Manufacturing Division, Benicia, Calif.



**STEAM SURFACE CONDENSERS  
EVAPORATORS  
STEAM JET REFRIGERATION  
STEAM JET AIR EJECTORS  
FEEDWATER HEATERS  
BAROMETRIC CONDENSERS**

**YUBA CONSOLIDATED INDUSTRIES, INC.**

takes time for the eyes to become adapted to the lower level of illumination. After being in the theater some time, details become quite discernable. While this illustrates a wider variation in levels of illumination than is found in an industrial plant, it demonstrates how slowly the eye adapts from high to low illumination levels.

If a stairway or corridor is poorly lighted as contrasted with a well lighted work room, a definite accident hazard exists because details are not quickly observed due to slow adaptation, a natural characteristic of the eye. The fact

that some eyes are slower to adapt than others increases the hazard.

Similarly, a mill yard which is illuminated by lamps spaced too far apart to provide uniform illumination might easily have danger spots between the lamps. Warehouse or storage areas having lower levels of illumination into which workmen may pass from a well-lighted workroom provide another example.

Work areas that are only fairly well lighted can present a hazard if there are swiftly moving parts of machines present. While this may not be due directly to adapta-

tion, we know that we can see quicker and easier under uniform, high-level, low brightness illumination. Fast seeing under good illumination, may prevent a hand from getting into a fast moving machine when reaching for a tool, or perhaps avoid a similar accident.

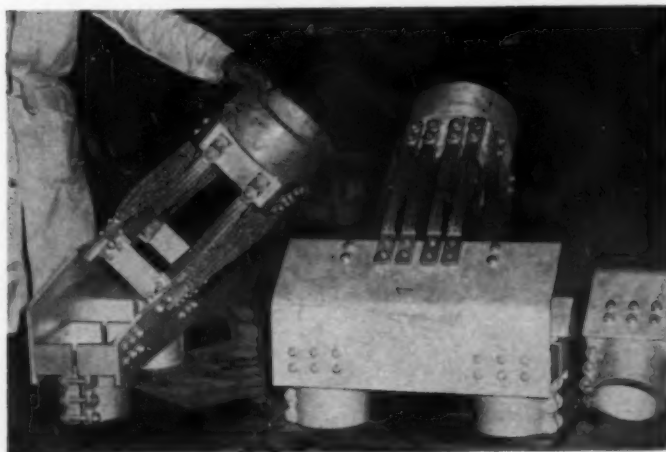
### Glare

Well-designed lighting fixtures adequately shield the lamps so that their brightness is not annoying. Sometimes incandescent lamps in adjustable fixtures over a machine are placed by the worker so that they are directly in the line of vision of other workers in the room. While a cursory observation may convey the impression that they are not harmful, workers who must face them for extended periods will quickly assert how troublesome they can be. Like the bright automobile headlamp at night striking a driver's eyes, they can momentarily paralyze seeing and in that short time an accident can result.

An excessive volume of light coming from a window which a worker must face can be a source of annoying glare. This glare may result even when the sun is not shining brightly because the contrast with the darker wall surrounding the window accentuates the brightness. Painting the glass reduces the glare but defeats the purpose of the window because the paint may absorb up to 95% of the daylight intended for illumination. Difficulty in controlling glare from windows has resulted in an increasing number of windowless industrial structures.

Glare, resulting from improperly controlled sources of light, causes discomfort and fatigue — reducing the worker's efficiency. It may interfere with clear vision to the extent that accident hazards are increased. Moreover, extended exposure to glare may tend to injure the eye and disturb the nervous system. Because such eye injury cannot be definitely pinpointed as an accident due to its insidious cause, the result upon the workers' welfare and upon

(Continued on Page 108)



## Connector Design — Economies for Texas Power & Light Co.

**TRANSFORMER** terminal connectors built by Burndy Corporation for TP&L's new Stryker Creek plant use angle plates instead of conventional castings to save about 100 lb per connector. Lighter weight cut material, manufacturing, handling costs and made connectors easier to install.

Connectors link 12½" od aluminum bus from generator to copper studs for the 13,000 v primary windings of the station's main transformer, rated at 200,000 kva. Connectors had to be flexible and incorporate a 45° angle so that the stud portion would swing out of the way for access to the transformer bushings.

Instead of the conventional

heavy casting, each connector has a pair of copper plates bent at 45°. Copper braid provides the required flexibility.

To protect aluminum-to-copper contacts from galvanic action ferules on the ends of the braid bolted to the aluminum casting are tin-plated. The other ends of the braid are bolted to silver-plated copper, resulting in a stable, low resistance connection.

In addition to the transformer connectors, Burndy also provided generator terminal-to-bus connectors, expansion connectors for round aluminum tubing to H-frame bus, 12½" od tubing-to-tubing connectors, and a generator neutral-terminal connector.



## Coal Handling Equipment by

# Continental

**A**nother example of Continental's close cooperation with prominent designing engineers on conveyor design, fabrication, erection. Call on your nearest Continental office for assistance on your problems.

Gorgas Steam Plant of the Alabama Power Company uses Continental Conveyors from track unloading to stock piling, and to Plant No. 1 (Units 1, 2 and 3) and Plant No. 3 (Units 8 and 9).



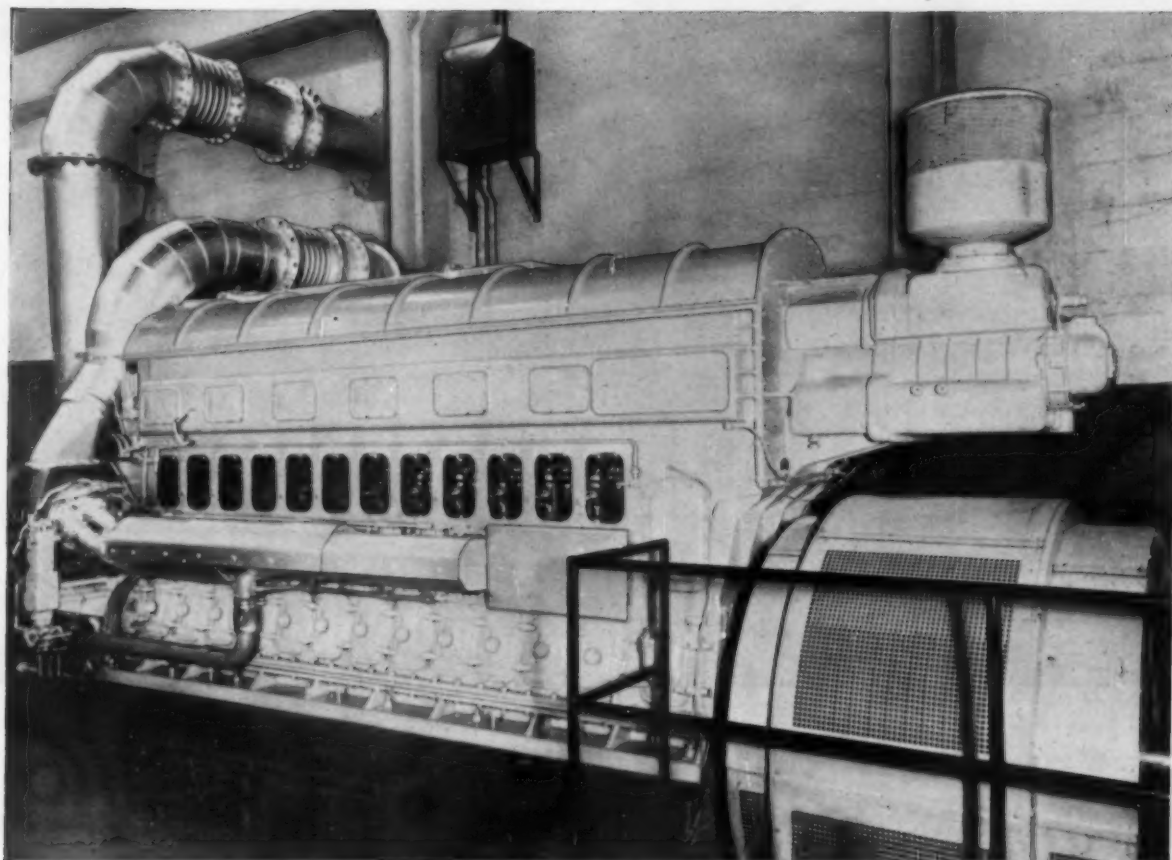
INDUSTRIAL DIVISION

**Continental Gin Company**

BIRMINGHAM, ALABAMA

ATLANTA • DALLAS • KNOXVILLE • MEMPHIS • MOBILE • NEW YORK 17

# NOW Fairbanks-Morse TURBOCHARGED

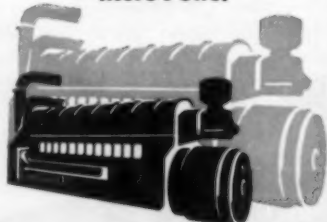


Now from Fairbanks-Morse comes the year's most significant power news: the Opposed-Piston diesel is turbo-supercharged!

Backed by 20,000 hours of actual operation and research, this new, yet proved, design increases O-P horsepower by 50%. At 900 rpm., for example, the turbocharged O-P is conservatively rated at 300 hp. per cylinder. Combining simple, two-cycle

Opposed-Piston design of engine with new Fairbanks-Morse designed system of turbocharging produces compact, reliable power with low operating and maintenance costs. None of the basic O-P advantages have been eliminated. In fact, many parts are interchangeable between turbocharged and non-turbocharged Opposed-Piston engine models.

## More Power



The un-turbocharged O-P is the industry's leader in compact power... now 50% more power can be placed in the same installation with the same size turbocharged O-P.

## Lower Weight



—per horsepower. Increased O-P power is more widely applicable where weight and foundation costs are restrictive. Weight per horsepower has been reduced by 27%.

## Increased Thermal Efficiency



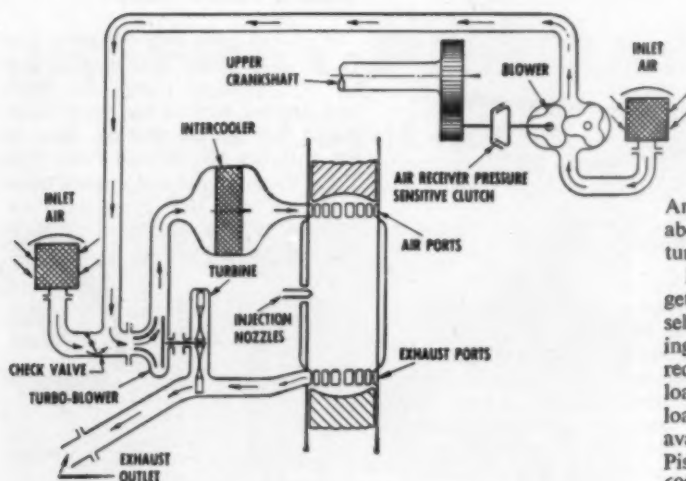
The new, performance-proved thermal efficiency of the turbocharged Fairbanks-Morse Model 38TD-8 1/2 O-P diesel is knocking on the door of a new high of 40% efficiency.



# OPPOSED-PISTON DIESEL

## 50% MORE POWER

### for Marine and Stationary Applications



#### Matched Engine and Turbocharging

Analysis of many turbocharging options established the above arrangement for optimum performance of the turbocharged Opposed-Piston diesel.

Exact matching of O-P engine and this system, together with manifold design, results in an engine that is self-sustaining over the entire load range, including starting. The small engine-driven auxiliary blower meets the requirements of sudden, large load changes at fractional loads only—and is automatically declutched above  $\frac{1}{2}$  load. Power formerly used for blower drive is therefore available at the flywheel of the turbocharged Opposed-Piston Diesel. Fairbanks, Morse & Co., Dept. SPI-4, 600 S. Michigan Ave., Chicago 5, Ill.



## FAIRBANKS-MORSE

a name worth remembering when you want the BEST

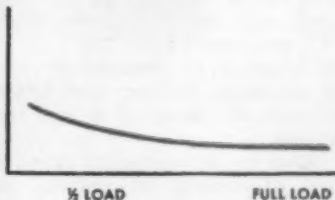
DIESEL AND DUAL FUEL ENGINES • DIESEL LOCOMOTIVES • RAIL CARS • ELECTRICAL MACHINERY • PUMPS • SCALES • HOME WATER SERVICE EQUIPMENT • MAGNETOS

#### Pulse System



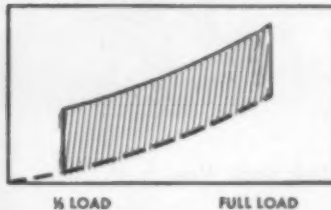
F-M exhaust manifolding carries peak pulse energy directly to the turbine drive, thus taking full advantage of additional driving force available in these exhaust pulses.

#### Lower Fuel Consumption



For full-load operations, specific fuel consumption of the turbocharged O-P is 5% to 10% lower than un-turbocharged O-P—and very much lower for part loads.

#### Bonus Power



At loads above approximately  $\frac{1}{2}$  rating, the auxiliary blower is automatically declutched, thus making additional, usable power available at the flywheel.



## NEW Product Briefs



### Metal-Cutting Band Saw Moves Right to the Job

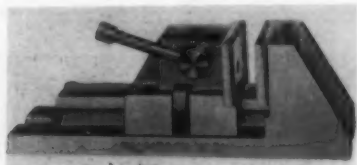
**D-1** The illustrated gasoline engine powered Kalamobile is a completely portable horizontal metal cutting band saw manufactured by the Machine Tool Div. of the **Kalamazoo Tank & Silo Company**, 657 Harrison St., Kalamazoo, Mich.

Combining self power and complete mobility, the Model 610D Metal Cutting Band Saw can now be used in all types of field work as

the gasoline engine powered Kalamobile or MG610D.

The MG610D is fast, accurate and a labor saver. It is used for all types of intermittent cut-off work such as pipe, cable, channel, conduit, and angles. The unit is powered by a reliable Continental Red Seal, 2 hp gasoline engine.

The chassis, with its "wheelbarrow" principle, is rolled about on 12" solid rubber tired wheels. Collapsible handles are telescoped into the handle tubes, eliminating objectionable interference when the



### Quick Lock Vise

**D-2** The new Palmgren No. 32 Quick Lock Vise has been announced by **Chicago Tool and Engineering Company**, 8383 South Chicago Ave., Chicago 17, Ill.

Designed for production drilling, tapping, and assembly, the Palmgren No. 32 locks quickly and positively with the Palmgren cam and "Y" lock mechanism. The vise has no screw to be damaged by wear or breakage. Bearing and locking surfaces are hardened to give long service.

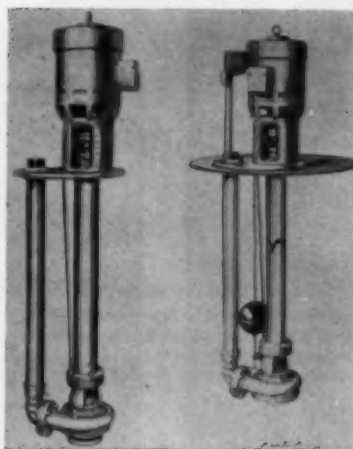
Ideal for all operations requiring fast adjustment for various size pieces, only a flick of the locking lever is necessary to release the quick lock, and the movable jaw slides easily to any position. Weighs only 2½ lb, with 2¼" jaw width,

1¼" jaw opening, 1¼" jaw depth. Can be carried easily in tool box by service and maintenance men.

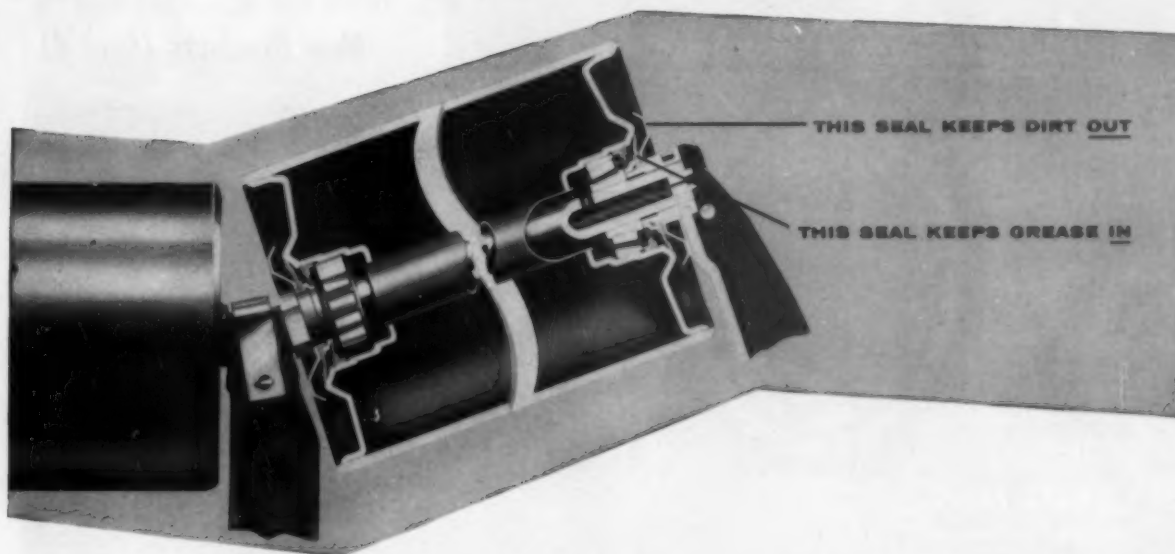
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### Sump & Process Pumps

**D-3** A new and complete line of heavy duty vertical centrifugal pumps for sump and process service has been introduced by **Goulds Pumps, Inc.**, 38 Black Brook Rd., Seneca Falls, New York. These single and duplex units, both wet and dry type, have capacities to 1080 gpm with heads to 290' for pit depths up to 20 ft.

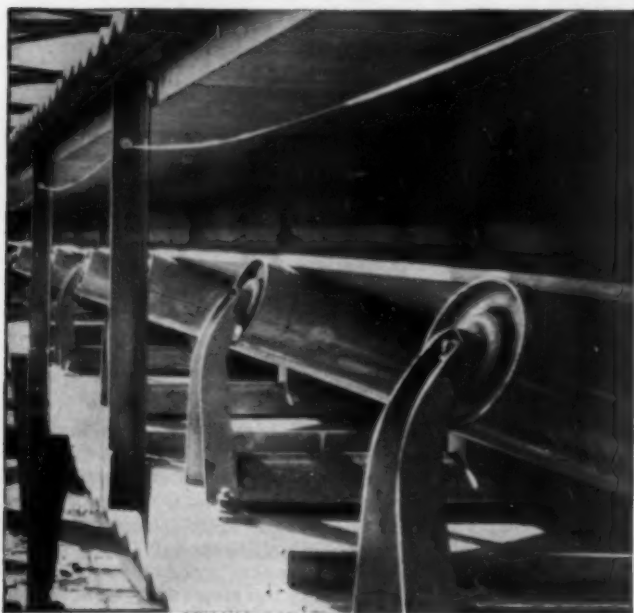


Basic design of Goulds Fig. 3171-2-3-4 sump pumps means that the pumping unit may be adapted in the field for changed pit depths or pump ratings simply by installing new and standardized parts. Vapor proof construction can be supplied on all units with all possible points of leakage of vapor or fumes sealed including shaft, bearing housing, cover plate, discharge pipe, grease pipes; float rod and pit covers are drilled on periphery for gasketed joints.



## JEFFREY PERMASEAL® IDLERS

The best built idlers for the toughest jobs



*Belt conveyor equipped with Jeffrey PERMASEAL® Belt Idlers handling coal at a power generating station.*

Grease can't get out to foul conveyor belts; dirt can't get in to damage bearings. Diaphragm double seals protect both ends of every roller. That's why Jeffrey Permasseal idlers give extra-long service with an absolute minimum of maintenance.

Greater dependability and longer life offset the slightly higher initial cost for Permasseal idlers. Pay off quickly on the tough jobs. Pay off, too, through less downtime, fewer replacements and lower upkeep on all belt conveyors.

Your materials-handling supervisor should have the new Catalog 909, Jeffrey Belt Conveyors. It has valuable design and descriptive data on these products. For a copy, write The Jeffrey Manufacturing Company, 898 North Fourth Street, Columbus 16, Ohio.

CONVEYING • PROCESSING • MINING EQUIPMENT...  
TRANSMISSION MACHINERY...CONTRACT MANUFACTURING



*Available* **FOR YOUR POWER PLANT...**



**FORCED  
DRAFT FANS**



**INDUCED  
DRAFT FANS**



**DUST  
COLLECTORS**

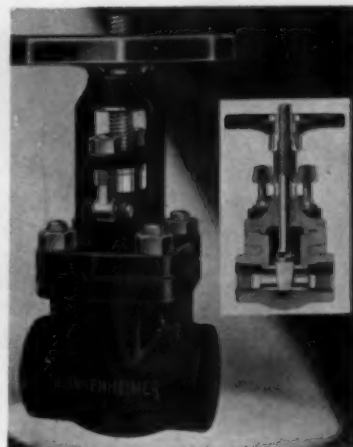


Equipment can be engineered and designed  
to meet variable operating conditions.  
Prompt quotations upon request.

**FLY ASH ARRESTOR CORPORATION**

274 North First Street • Birmingham, Alabama

## **New Products (Cont'd)**



### **Gate Valves Feature Easy Installation**

**D-4** A new line of forged steel gate valves built for easy installation in the most cramped quarters, has been introduced by **The Lunkenheimer Co.**, Cincinnati 14, Ohio.

Featuring the preferred bolted bonnet design, with outside-screw rising stem, solid-wedge disc, and rolled-in seat rings, these gate valves are available with screwed or socket welding ends in sizes  $\frac{1}{2}$ " through 2". Valves are rated 800 lb at 850 F, and 2000 lb at 100 F.

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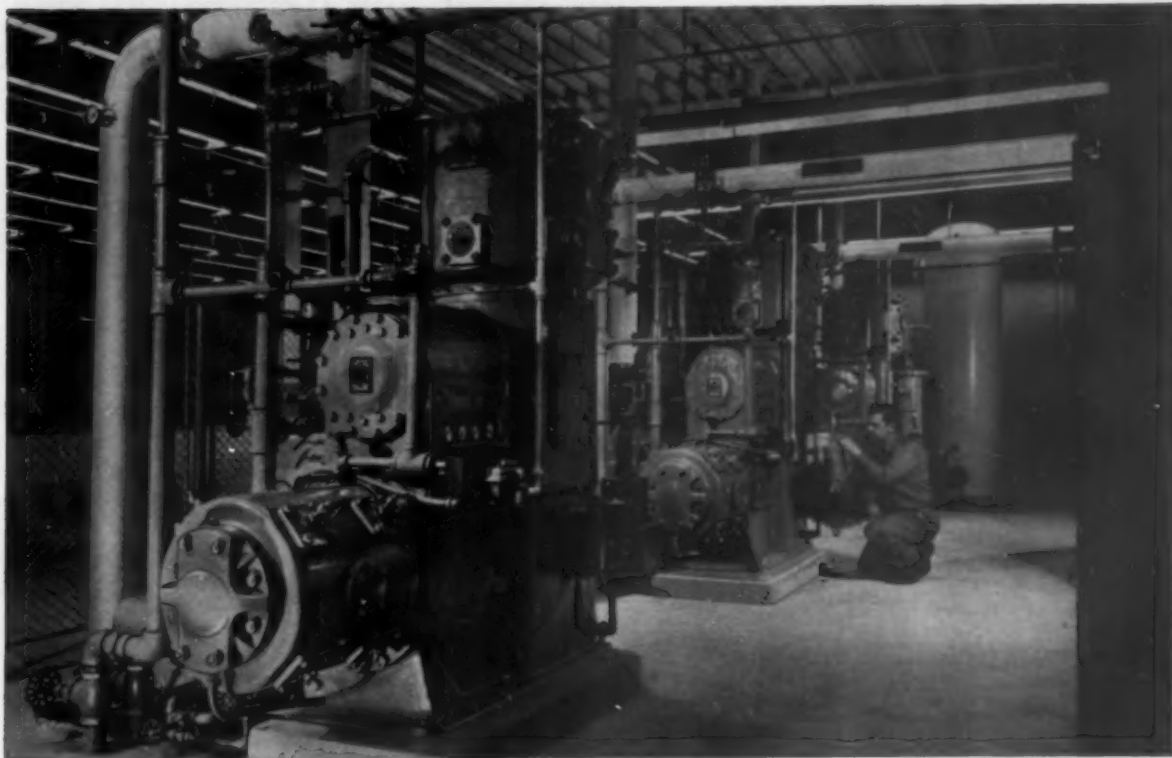
### **Extinguishing Agent for Metal Fires**

**D-5** Magnesium, titanium and zirconium are highly flammable. Compared with other extinguishants in respect to this hazard, TMB Liquid produced by **Callery Chemical Co.**, Callery, Pa., forms a molten coating that excludes the atmosphere from metal fires, giving off fumes that are virtually non-toxic.

TMB is a colorless liquid containing a high percentage of trimethoxyboroxine. It burns to give a coating of molten boric oxide over the metal. This molten flux excludes air and is effective in extinguishing titanium, zirconium and magnesium fires. By proper application it is also possible to control sodium and sodium-potassium alloy fires.



# FOR SUPERSONIC AIR POWER



## Ingersoll-Rand XLE compressors provide dependable plant air for North American Aviation—specialists in supersonic flight

At North American Aviation's Los Angeles (Calif.) Division—where tomorrow's supersonic flight is being developed today—these three Ingersoll-Rand XLE compressors are on duty around the clock, providing a never-failing supply of air power.

These modern packaged-design compressors save valuable floor space and are shipped fully-assembled, ready to install on a simple foundation. "Thru-frame" air flow eliminates inter-stage piping. Full-floating aluminum bearings are foolproof—sealed crankcase never needs to be opened for bearing adjustment, so dirt (the major cause of wear) is kept out of the oil. All moving parts are pressure-lubricated. Push-button starting and simplified operation are standard, and fully-automatic or remote controls can be supplied if desired.

These XLE compressors are built in sizes from 125 to 350 hp—other Ingersoll-Rand compressors are available from 1/4 to 6000 hp. Contact your I-R representative for help with your compressor problems.

**Ingersoll-Rand**  
1-721 11 Broadway, New York 4, N. Y.



### AIR-CUSHIONED CHANNEL VALVES CUT DOWN-TIME

The heart of any compressor is its valving ... Cut valve replacement and you've solved the No. 1 compressor maintenance problem. Ingersoll-Rand Channel Valves do just that. They are known the world over for remarkable durability, high efficiency and quiet operation. They are entirely different from any others—each valve is a combination of straight-lifting stainless-steel channels and leaf springs, with trapped-air spaces which cushion action and prevent impact. And only I-R compressors have Channel Valves.



COMPRESSORS • GAS & DIESEL ENGINES • PUMPS • AIR & ELECTRIC TOOLS • CONDENSERS • VACUUM EQUIPMENT • ROCK DRILLS



## Is your plant CRITICALLY SHORT of WATER?

You will make major water savings, reduce your costs, solve your problems of water supply or disposal and get **HIGH OPERATIONAL EFFICIENCY** with Niagara "Aero" Evaporative Heat Exchangers, After Coolers or Condensers for these important plant services or processes:

- **AFTER COOLING** and air drying for large air and gas compressors and **AIR LIQUEFACTION**
- **COOLING ENGINES, COMPRESSORS, HYDRAULIC PRESSES**
- **COOLING QUENCH BATHS, FURNACES, INERT ATMOSPHERES**
- **COOLING ROLLS, WELDERS, DRAWING OR EXTRUSION DIES**
- **PRODUCT AND PROCESS COOLING** CHEMICALS OR INTERMEDIATES
- **COOLING LIQUIDS OR GASES IN CLOSED SYSTEMS**
- **VAPOR CONDENSING UNDER VACUUM**
- **ELECTRONIC PROCESS COOLING**

High operational efficiency means: precise temperature for improved product and process quality control, heat removal at rate of input, simple operating conditions, real economy in upkeep, sustained full capacity.

Also it means cooling in a closed system with your product kept free from contamination or, when condensing, getting a pure condensate holding high quality in your product or material.

Niagara machines do the work of a cooling tower plus shell-and-tube coolers with a single machine that saves piping, water handling disposal and treatment expense and 95% of water consumed by contact cooling methods.

*Write for Bulletin 129, 130, 132, 136R.*

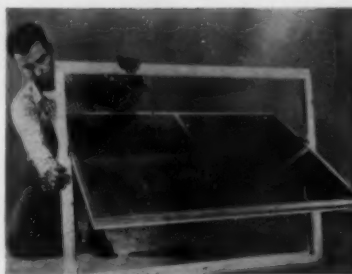
### NIAGARA BLOWER COMPANY

Over 35 years of Service in Industrial Air Engineering

Dept. SP-4, 405 Lexington Avenue  
NEW YORK 17, N. Y.

District Engineers  
In Principal Cities of U. S. and Canada

## New Product Briefs (Continued)



### Maintenance-Free Plastic Window

**D-6** An easy-to-install metal and plastic window that requires almost no maintenance has been developed by the **Resolite Corporation**, Zelienople, Pa.

Pre-assembled with panes of shatterproof Resolite translucent Fiber-glas-reinforced plastic in aluminum or steel frames, and in pivoted or projected units, the new lightweight windows pass almost as much light as clear glass — a soft, diffused light that eliminates glare and reduces workers' eyestrain.

Called Reso-Lite-Vents, the new windows are ideal for industrial use where large ventilated areas and glare-free light are specified, according to the manufacturer. Ventilation is provided by the entire window area.

Many of the separate operations normally required to install windows — detailed drawings, special framing members, glazing and painted — are eliminated with Reso-Lite-Vents. They are available in a wide variety of sizes, are shipped ready to install, and may be erected in conjunction with corrugated metal sheeting, translucent plastic corrugated panels, or masonry.

Practically no metal in the units is exposed to weathering, and the Resolite plastic panes are shatterproof and maintenance-free.

### Settling Tank for Industrial Wastes

**D-7** An improved settling tank design, the Uniflow Settling Tank, for removal of solids from water, sewage and industrial wastes, has been announced by **Link-Belt Company**, Prudential Plaza, Chicago 1, Ill.

The Uniflow Tank combines a

rapid sloping bottom with multiple effluent weirs. This advanced design increases efficiency of solids removal, offers economical construction, and as the name Uniflow implies, maintains the velocity of liquid throughout the tank at as nearly uniform a rate as practical tank construction allows. Link-Belt Straightline sludge collectors provide positive removal of scum from the surface of the liquid and sludge from the bottom of the tank.

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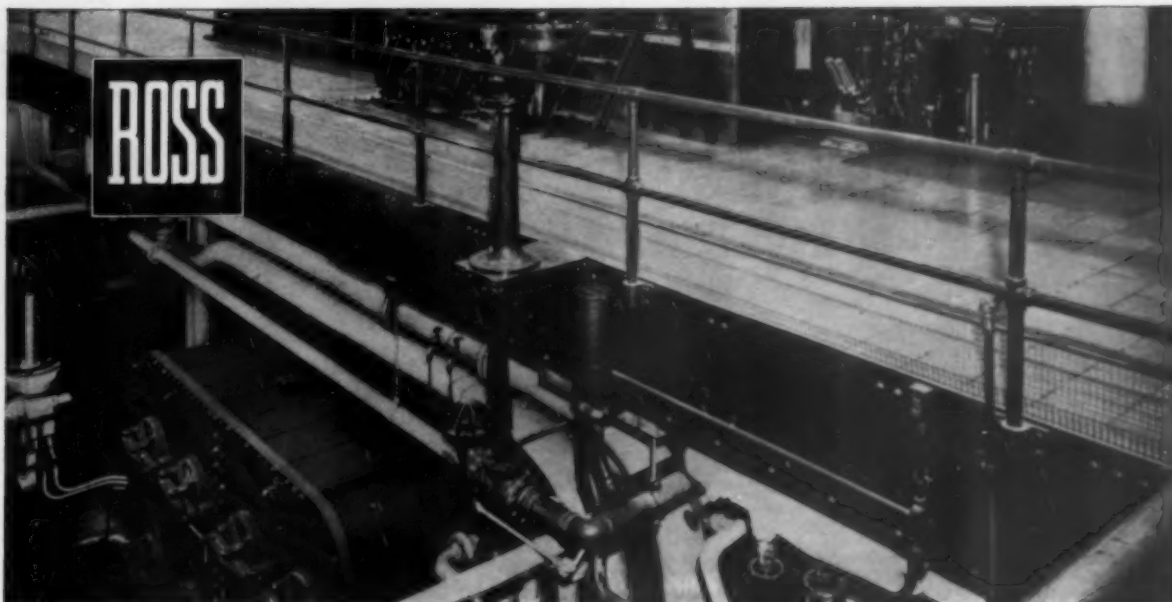


### Relay Testing Unit

**D-8** A new device by **Multi-Amp Corporation**, 465 Lehigh Ave., Union, New Jersey, provides phase angle meter, voltmeter and appropriate connections in one compact box to make relay testing easier and faster. Used as a convenient junction joint when an output, variable in phase and magnitude, is required, in conjunction with a phase shifter and other equipment.

Multi-Amp Model 1002/3PHM Central Station has a rating of .2 KVA, with an input of 115 volts, 60 cycles. 220 volt variable auto-transformer is used on 115 volt input for minimum distortion. "High" and "Low" ranges are provided. The instrument is thoroughly portable, weighing less than 25 lb.

Multi-Amp Model 1002/3PH Central Station is also available. This has connections for phase angle meter and voltmeter as well as phase shifter, but does not include them. Weight is 15 lb.



**IN A SIDE-BY-SIDE COMPARISON...**

## **"Ross Condenser brings turbine up to full load quicker"**

On duty in a northwestern power plant, a Ross Surface Condenser is serving one of four identical 35,000 KW turbine-generator units.

Although only one of the four condensers is a Ross unit (there are two other makes), the chief turbine engineer of this station singled it out for top performance: "The Ross Surface Condenser can bring the turbine up to full load quicker than any of the other condensers in this plant. It has been performing satisfactorily for 25 years. Our operators are well satisfied."

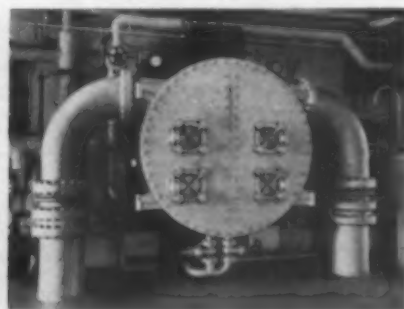
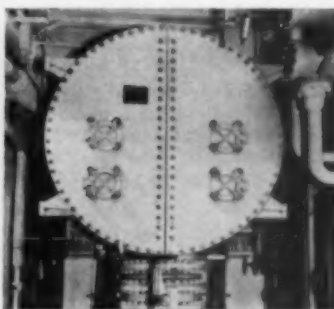
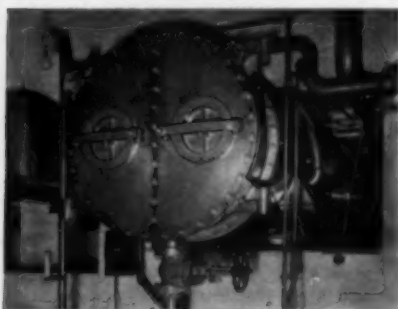
This is just one instance—there are numerous others (a few are also shown here) where Ross Condensers have clearly demonstrated superior efficiency and dependability. And this is not surprising. For over 40 years, Ross has set the pace in the design and con-

struction of heat exchange equipment, by continually stressing advanced engineering... engineering that introduced the first all-welded steel surface condenser in the United States, and pioneered numerous other developments, including Balanced Flow and divided tube bank design.

It's only logical then, that Ross is uniquely qualified to meet your surface condenser requirements. Consultation with Ross engineers will leave you assured of this.

For detailed information on Ross Twin Bank Condensers, or the smaller, Single Bank Type, request Bulletins 8.2K1 and 8.1K1 respectively.

American-Standard, Ross Heat Exchanger Division, Buffalo 5, N.Y. In Canada: American-Standard Products (Canada) Limited, Station D, Toronto, Ont.



# **AMERICAN-Standard**

**ROSS HEAT EXCHANGER DIVISION**





**"THIS LUBRICANT  
WAS THE ANSWER  
TO OUR  
MAINTENANCE  
PROBLEM"**

says the MOLYBDENUM CORP.  
of America

"We use a Hardinge conical ball-mill driven by a large gear and pinion in the processing of tungsten and molybdenum concentrates. Silicious dust from the grinding was absorbed by the soaplike lubricant we were using and formed a highly abrasive compound. Frequent replacements of gears and pinions were major maintenance expenditures. The change to LUBRIPLATE Lubricants was the solution to our problem . . . not a gear nor pinion replacement in four years."

William F. Allen, Works Manager

**REGARDLESS OF THE SIZE AND  
TYPE OF YOUR MACHINERY,  
LUBRIPLATE GREASE AND  
FLUID TYPE LUBRICANTS WILL  
IMPROVE ITS OPERATION AND  
REDUCE MAINTENANCE COSTS.**

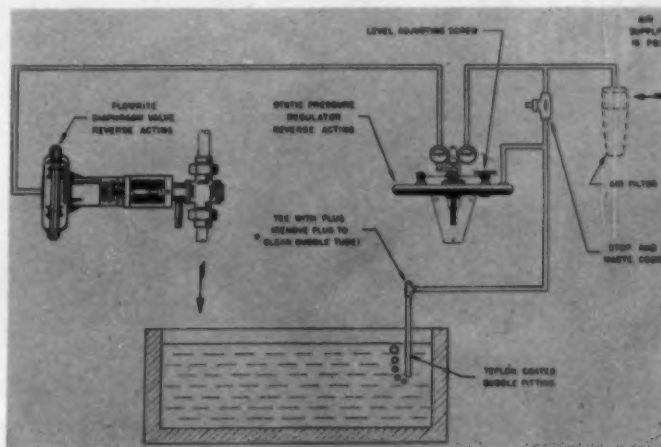
LUBRIPLATE is available in grease and fluid densities for every purpose . . . LUBRIPLATE H. D. S. MOTOR OIL meets today's exacting requirements for gasoline and diesel engines.



For nearest LUBRIPLATE distributor see Classified Telephone Directory. Send for free "LUBRIPLATE DATA BOOK" . . . a valuable treatise on lubrication. Write LUBRIPLATE DIVISION, Fiske Brothers Refining Co., Newark 5, N. J. or Toledo 5, Ohio.



## New Product Briefs (Continued)



### Liquid Level Control

**D-9** An air-operated control system that keeps liquid levels from varying more than  $\frac{1}{4}$ -in. is being marketed by the Powers Regulator Company, 3434 Oakton St., Skokie, Ill.

Called the Powers bubbler system, it is based on the fact that a drop in the level of any liquid will reduce the back pressure of air being bubbled through the liquid. This pressure fluctuation can be used to actuate a pneumatic valve on the liquid supply line.

The new system works as follows: The end of an air line, or bubbler, is placed below the surface of the liquid. If necessary, the bubbler can be coated to prevent caking.

Air at 15 psi or less passes through the line, causing a slight bubbling action in the liquid. The air pressure in the line to the bubbler is

also transmitted to a static pressure regulator.

Should the liquid drop slightly from its proper level, the pressure of the liquid upon the tip of the bubbler will be reduced. Thus, less pressure is required to force air out of the pipe.

This change in pressure is transmitted back to the static pressure regulator. The regulator, in turn, will re-position the Flowrite diaphragm control valve on the liquid supply line, gradually increasing the flow of liquid into the container to regain the proper level.

Once installed, the level of the liquid can be adjusted over a range of  $1\frac{1}{2}$  in. The adjustment is made on the control point of the static regulator.

Because the bubbler system maintains gradual control of the liquid, there is little wear on instruments and valves.

### Screw Elevator Has Leak-Proof Drive Head

**D-10** The new Super-Lift Screw elevator by Fort Worth Steel & Machinery Company, Box 1038, Fort Worth, Texas, features a drive head from which oil will not leak and contaminate foods or other bulk materials being handled.

Cross section drawings illustrate design features. Top DSD unit provides triple protection against oil leakage:

(1) As oil level is below top of bearing housing, there's no oil pressure on the vertical drive shaft;

(2) Only a positive metered amount of lubricant is fed to bearing;

(3) A shaft umbrella diverts metered oil from the bearing directly to the reservoir, thus preventing possibility of leakage down the vertical shaft.

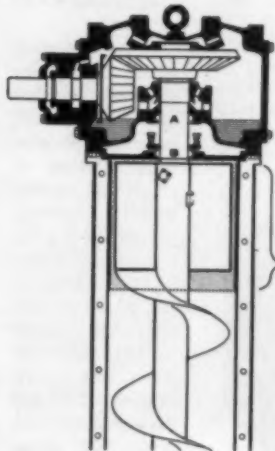
Felt seal (A) around the shaft prevents entry of dust into the gear housing.

In bottom DSD unit there's triple protection to prevent entry of foreign material into the unit. Dust flinger (D) diverts dust-laden atmosphere away from face seal (E). Mechanical seal (F) provides added protection. Springs maintain proper

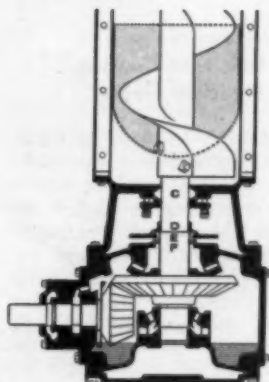


tension on the elevator housing. Space about A-B and C-D is open for easy visual inspection.

The DSD unit is entirely outside the elevator casing, while in a conventional drive, unit extends a reservoir of oil into the casing, generating pressure against the shaft seal. With no part of the DSD unit in the casing, the Super-Lift elevates material higher within total elevator height than elevator with conventional drive unit.




ELEVATOR  
DISCHARGE  
OPENING



- A—Felt Seal
- B,C—Packing Glands
- D—Dust Flinger
- E—Face Seal
- F—Mechanical Seal
- Oil

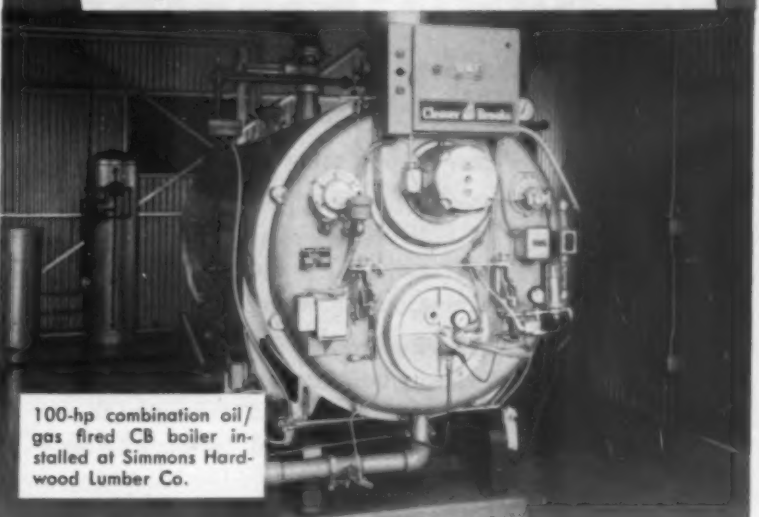
The DSD has no exposed unused shaft. A plate covers opening where a pinion gear assembly and shaft can be inserted when needed to take off power to drive connecting equipment such as a horizontal screw conveyor. DSD units have a hard metallic coating on shafts and gears for extra long life and smooth operation.

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**"40% SAVINGS ON FUEL,"**  
says ROY K. STILLWELL, Simmons Hardwood Lumber Co.  
Los Angeles, California

"We are pleased to report that this entire automatic boiler installation has been successful in every respect. We find that fuel saving over our old installation is about 40%, which means that the installation will quickly pay for itself. "Since we specialize in high-grade domestic and foreign hardwood lumber and pride ourselves on an outstanding dry kiln operation, we must have good high-quality steam. We are receiving exceptional results from our Cleaver-Brooks boiler."



100-hp combination oil/gas fired CB boiler installed at Simmons Hardwood Lumber Co.

For process steam economy . . .

## Install a packaged CB boiler

CB boiler four-pass design with forced draft is the most efficient combination to transmit heat to boiler water. Forced draft blower provides correct amount of air for complete combustion, eliminates the need or cost of a high, expensive chimney. Combustion gases are forced at high velocity through the four passes, literally scrubbing heat from the flame. Result: lower fuel costs.

Five square feet of heating surface per boiler hp is another reason why CB boilers give you longer service life with less maintenance. Every CB boiler is guaranteed to operate at a minimum efficiency of 80%.

Each Cleaver-Brooks self-contained boiler is a complete package. Fully factory tested, it's ready for installation, service connections and opera-

tion. No make-ready delays . . . no extra parts needed.

A trained technician starts your CB boiler, adjusts it for your specific needs, and trains your attendant in care and maintenance.

Available in 19 sizes, 130 models, 15 to 600 hp—steam or hot water, gas, oil, or combination oil/gas fired.

For more facts on the self-contained CB boiler, contact your dealer or write: Cleaver-Brooks Company, Dept. D, 305 E. Keefe Ave., Milwaukee 12, Wisconsin.

**Cleaver  Brooks**

ORIGINATORS OF SELF-CONTAINED BOILERS

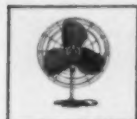


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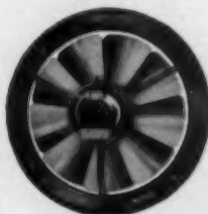
Emerson-Electric Air Circulators create cooling breezes in plants, laboratories, kitchens and recreation areas... make working conditions more pleasant.

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### Direct-Drive Exhaust Fans

Remove stale air, steam and odors from your building. Step up efficiency, cut down labor costs... install Emerson-Electric Direct-Drive Exhaust Fans.



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OF ST. LOUIS



SINCE 1890

## New Products (Cont'd)

### Continuous Boiler Blow-Off Valve

D-11

A new inexpensive and efficient single orifice Bean Valve has been added to the continuous blow-off valve line of The Uniblow Valve Company, 1920 West 77th St., Cleveland 2, Ohio.



It is furnished with six different size orifice beans which are interchangeable, thus making it adaptable to any boiler capacity simply by changing the orifice bean. Orifice beans are available for boilers up to 300 lbs pressure, and boilers up to 650 lbs pressure. Bulletin 500 gives details.

### Chemical Resistant Coating Poured-in-Place on Floors

D-12

Monile — a high strength, impact and chemical resistant poured-in-place monolithic floor surfacing developed by The Master Mechanics Company, 2097 Columbus Rd., Cleveland 13, Ohio — is applicable to critical areas exposed to destructive process solutions, acids, alkalis, salts, fats and greases.



Industrial floor coating can be applied with equal success to concrete and wood. Named for its monolithic

surface, Monile compares in appearance with dense ceramic materials. It cures rapidly. Half-inch applications are recommended, so that there is no necessity for cutting out old floors. Ingredients can be mixed in conventional cement or plaster mixers and any surface attainable with concrete or cement can be obtained by troweling without impairing the non-slip qualities of the material. Application data sheets and case studies are available from the manufacturer.

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#### Boiler-Burner Units

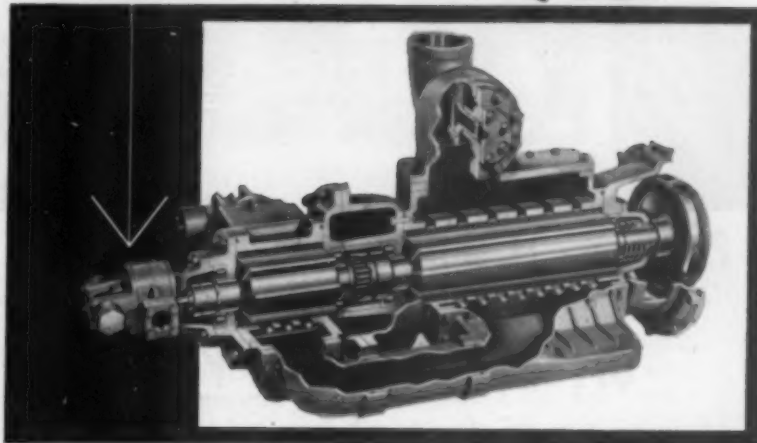
Factory assembled 18-92 D-13 hp boiler-burner units have been announced by American-Standard, Kewanee Boiler Division, 101 Franklin St., Kewanee, Ill., featuring the Kewanee Scottie Jr. Boiler and Iron Fireman burners for gas, oil or combination gas-oil firing.

The completely integrated units are available in 8 sizes of high pressure packages, 125-150 swp, 18-92 hp, and 8 sizes of low pressure packages, 15 lb steam or 30 lb water, 606,000-3,050,000 Btuh.

Completely automatic forced-draft firing is a feature of the new Kewanee-Iron Fireman packages requiring only a vent pipe regardless of boiler room location or atmospheric conditions. The units may be ordered completely assembled — with burner, blower, controls, fittings and trim in place — and fire-tested at the factory; or, if preferred, the boiler will be shipped first and the burner at a later date for field mounting.

Burner features include complete carbureting of No. 5 oil or lighter and, on combination gas-oil firing, quick fuel changeover by simple valve control. Boiler features include cast iron, insulated flue doors and 3-inch fire tubes set with roller expander and beaded at each end.

## JAEGER DEPENDS ON ROPER PUMPS ...so can you



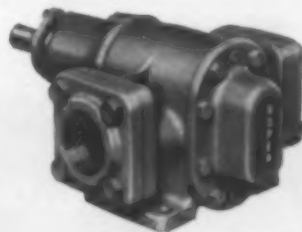
### TWO STAGE ROTARY COMPRESSOR COOLED BY ITS OWN LUBRICATING OIL

Typical of Roper adaptability to heavy duty equipment is this installation on the Jaeger Roto Air-Plus, 2-stage rotary compressor. The pump sprays cooled, filtered oil onto the rotor and bearings in high and low compressor cylinders in order to lubricate all surfaces and seal against air leakage. The efficiency of the cooling system insures cool operation in ambient temperatures exceeding 100°. Arrangement of the system is such that oil-free air reaches the air service valve.

The Jaeger compressor has established service records of maintaining 100 lbs. constant pressure for 160 hours, without let-up — a tribute to the unit's dependability, and the Roper that helps cool it.

#### For OEM... Specify ROPER

In this instance, the Series K pump is suited to the Jaeger application. This series is available in sizes  $\frac{1}{2}$  to 50 GPM, pressures to 150 PSI. It is a rotary gear unit, with sizes 10 through 50 featuring the patented venturi suction and discharge principle for smooth, quiet operation.



**ROPER**  
HYDRAULICS, INC.

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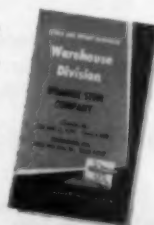
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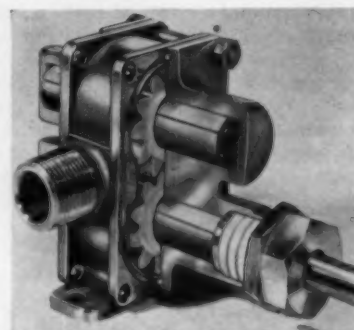
WAREHOUSE DIVISION

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**BIRMINGHAM** 4230 1st Avenue South • WOrth 1-2147

## New Products (Cont'd)



### Teflon Gear Pump

A new self-priming rotary gear pump suitable for non-lubricating and corrosive fluids, is now available from **Eco Engineering Co.**, 12 New York Ave., Newark, N. J.

The pump, with  $\frac{1}{4}$ " inlet and outlet ports, features housings of 316 stainless steel or Hastelloy C with Teflon gears and internal Teflon bearings and packing.

Designated the GearChem, the unit is designed to operate at 1750 rpm with fluids of low viscosity, at capacities to 10 gpm and pressures to 100 psi. Fluids with viscosities to 5000 SSU can be pumped at reduced speeds.

### Ground Alert Detects Line-to-Ground Faults

Portable and stationary units by **Delta Engineering Sales Co.**, Box 1403, Shreveport, La., detect line-to-ground faults immediately.

The Delta - Desco electronic Ground Alert will stop costly factory shutdowns due to grounded power failure, save on expensive motor rewinds, protect valuable switchgear and transformers and prevent possible fire damage.

Portable and stationary units are available. Ground alert is connected to your 220 or 440/480 volt 3-phase electrical system and detects line-to-ground faults immediately and positively so they can be corrected quickly before becoming dangerous and costly. Standard factory setting is 7,500 ohms. Resistance to ground can be factory adjusted from 20,000 ohms to zero ohms.

A green light burns continuously when system is normal. When a ground becomes evident in any phase the green light goes out and a red





light flashes on and a bell continues to ring until switched off or the system cleared.

Form 255 gives design and operational details.

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#### Block Insulation for High Temperature Vessels

**D-16** Abosite — a new asbestos-base block insulation introduced by the **Aber Company, Inc.**, Box 2535, Houston, Texas, combines durability, lightness of weight, minimum shrinkage and other desirable features.

Composed of long-fiber asbestos bonded with an inorganic silicate binder, it is available in two types — "Standard" to withstand temperatures to 1,000 F, and "Super" to 1,850 F. Abosite is available in thicknesses from 1-in. through 4-in., in 36-in. lengths, and in widths ranging from 6 to 48-in.

The block insulation for high temperature vessels has no shrinkage up to 800 degrees and only negligible shrinkage at higher temperatures. It will not pulp or wash off when exposed to moisture. It is not brittle and is not materially affected by steam, acid and fumes.

Abosite block is hard on both main surfaces, yet cushioning and resilient in the center. Therefore, when vessels expand under heat, the block insulation also expands under the resulting pressure. It is applied by standard methods and is easy to cut and fit.



## SPECIAL ZINC-RICH COATING GIVES GALVANIC PROTECTION TO METALS

Galvanox is a special coating composed of an extremely high percentage of metallic zinc in an organic binder. The resulting film supplies an electro-chemical type of protection long associated with galvanizing. Applied as a paint, it dries and "cures" to form a very dense coating of metallic zinc.

Galvanox comes ready-mixed in a natural zinc color only and has specialized uses and applications, as:

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- For use as an electrical conductor
- For minimizing electrolysis
- For use as a metal filler
- For underwater, underground or high humidity exposures.

Learn more about the application of Galvanox and its low cost. Write today for a copy of "Galvanox by Subox."

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# NEW Catalogs & Bulletins

## STEAM TURBINES . . . FURNACES BOILERS, STOKERS, BURNERS

**1—Package Boiler** — New compact, low cost package unit (oil or gas fired) for small space requirements is described in Bulletin DK-1. Pressures to 325 psi, steam capacities to 45,000 lb/hr.—E. KEELER CO.

**4 — Steam Generators** — Bulletin AXY - 1 describes auxiliary equipment and design features of the Amesteam Generator for sizes 10 through 600 hp and illustrates how this integrated design reduces cost and increases life and reliability.—AMES IRON WORKS, INC.

**9—Free Coal Counseling** — General information on how Coal Bureau engineers will advise on selection, transportation and utilization of the right coal for your purpose.—NORFOLK AND WESTERN RAILWAY.

**16 — Small Boiler Performance** — Brochure shows how the packaged Ljungstrom air preheater boosts performance. Boilers as small as 25,000 lb/hr can have advantages of regenerative preheating—saves fuel, boosts output, and permits use of lower grade fuels.—THE AIR PREHEATER CORPORATION.

**19—Feed Water Deoxygenation**—12 page Bulletin BW-7 describes advantages of chemical deoxygenation of boiler feed water with an aqueous solution of Hydrazine. Covers in detail the properties and action of Hydrazine in maintaining boilers as well as recommended methods of application. — FAIRMOUNT CHEMICAL CO., INC.

**33 — Wall Deslagger** — Design & operational features of furnace wall deslaggers discussed in Bulletin 1034.—COPES-VULCAN DIVISION.

**40—Coal for Heating & Cooling** — 16 page brochure describes boiler plant for heating and cooling the Hillside, Ill. Shopping Center. Drawings show the boilers and coal and ash-handling equipment. — BITUMINOUS COAL INSTITUTE.

**56 — Water Tube Boilers** — Booklet — Describes details of stoker — oil or gas or combination gas/oil, 10 to 350 hp to 250 psi; designed for easy conversion to any fuel. — QUEEN CITY ENGINEERING CO.

**62 — Firing Unit** — LoStokers efficiently fire small boilers; either firebox or brickset applications; capacity range 3,000 to 12,000 lb/hr. — DETROIT STOKER COMPANY.

**76—Packaged Combustion** — Gas, oil or combination packaged forced draft burner for either conventional or pressure firing of scotch marine boilers; larger sizes for water tube boilers; flame retention ring insures stable operation over full range; 13 sizes from 60 to 500 hp described in B13 literature. — THE WEBSTER ENGINEERING COMPANY.

**81—Fly Ash and Dust Recovery** — Engineering Booklet — Gives data and illustrations on the multiclone mechanical dust collector, showing basic principles and typical application for dust and fly ash recovery. — WESTERN PRECIPITATION CORP.

**87—Steam Turbines—Single Stage** — Bulletin 500 describes features and characteristics of company's type DH steam turbines in horizontal and vertical models. — DEAN HILL PUMP COMPANY, INC.

## FANS—PUMPS—COMPRESSORS HEATERS—HEAT EXCHANGERS

**102—Teflon Gear Pump** — Bulletin describes self-priming rotary gear pump suitable for non-lubricating and corrosive fluids. Suitable for speeds to 1750 rpm at capacities to 10 gpm & pressures to 100 psi. — ECO ENGINEERING CO.

**110 — Deaerator** — Publ. 4651 describes design that eliminates tubular vent condensers without impairing efficient purging of non-condensable gases. Unit handles wide range of operating conditions. — COCHRANE CORPORATION.

**123 — Slurry Pump** — Catalog describes the new SP-90 slurry pump which permits proportion of slurries in the mix tank to remain constant, with pumping rates variable from maximum to 1/5 of maximum. — MANZEL.

**132—Glassed Centrifugal Pumps** — 12 page Bulletin 725.2 describes line of glassed pumps for handling corrosive acids and alkalis. Every part of pump exposed to liquid has a tough glass surface. Specification, ratings, dimensions. — GOULDS PUMP, INC.

**147—Strainers** — Bulletin 400 describes "Ezy-Kleen" line featuring removable clean-out baskets. Offer low pressure drop protection (head of pump) from undesirable substances in pumpage. — BLACKMER PUMP COMPANY.

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**155—Axial & Mixed Flow Pumps** — 12 page Catalog G-100 describe axial and mixed flow vertical and horizontal pumps. Capacities from 5,000 to 200,000 gal/min; heads from 5 to 75 feet. — C. H. WHEELER MFG. CO.

**192—Induced Draft Fans** — Catalog 905 describes the new Type DN Dynacurve fans offering minimum floor space & height requirements, and high efficiency over wide performance range. — CLARAGE FAN COMPANY.

#### INSTRUMENTS—METERS CONTROLS—REGULATORS

**208—Liquid Level Controls**—Catalog describes controls for almost any liquid, at any pressure, at any temperature. Can be furnished in top-mounting, side-mounting styles, or as external float cage units. Almost unlimited application. — MAGNETROL, INC.

**223—Combustion Control** — Bulletin 1023, 24 pages—Contains actual installation photos and diagrams.

tics of Bailey air operated combustion control for oil and gas fired boilers; two pages of chart records and six page list of typical installations. — BAILEY METER COMPANY.

**225—Cooling Controls** — Self-powered controls for compressors, stills, solvent coolers, degreasers, small engines, etc., described in Bulletin 710; operational and hook-up sketches. — SARCO COMPANY INC.

**228—Fuel Cut-Outs & Water Level Alarms** — Brochure D2 — Electrode type equipment for installation on water columns to provide fuel cut-out, high and low water level alarms and pump cut on and off. For pressures to 2500 psi. —

#### RELIANCE GAUGE COLUMN CO.

**231—Control Valves** — Catalog No. 305 illustrates and describes construction and specifications for a wide line of air operated diaphragm control valves suitable for the majority of general process applications and plant services. — MASON-NEILAN.

**254 — Pilot Pressure Controller** — Bulletin D-4 — Describes the dependable Wizard pilot, Series 4100 U, in a new gas type weather-proof case for flush or surface panel mounting, available with either bellows or Bourdon tube measuring elements for pressures from inches of water to 10,000 psi. — FISHER GOVERNOR CO.

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# **PLANT EQUIPMENT—WELDING TOOLS—PROCESS SPECIALTIES**

**302—Industrial Metals** — Fact Folder 9D describes stainless steel sheet, plate, strip, rod, pipe, etc., immediately available for fast, accurate delivery.—**REYNOLDS ALUMINUM SUPPLY CO.**

**305 — Industrial Heating** — Catalog 50, 50 pages — Gives data on the type and size of electric heating units and similar equipment for industrial heating needs. Detailed diagrams and photographs describe applications.—**EDWIN L. WIEGAND CO.**

**309—Elevated Steel Tanks** — 16 p "Tank Talks" shows various

types of tanks constructed and erected by manufacturer as well as stand pipes, reservoirs, storage and high pressure vessels, cylinders, etc.—**R. D. COLE MANUFACTURING COMPANY.**

**319—Portable Band Saw** — Bulletin describes the Kalamobile, a portable metal-cutting band saw. Has rubber-tired 12" wheels and telescoping handles. Capacity 6" rounds - 10" flat.—**Machine Tool Div., KALAMAZOO TANK AND SILO CO.**

**328—Beam-Type Guardrail—Manual** FB-3456 describes how Flex-Beam Guardrail protects danger spots along roads, highways, bridges, and in industrial plant locations. Installation photos, drawings, refer-

ence data, dimensions and physical properties.—**ARMCO DRAINAGE & METAL PRODUCTS, INC.**

**327—Steam Fan Heater** — Bulletin 109 discusses heater design which makes full use of all latent and sensible heat in steam up to 200 lbs without requiring expensive piping and pressure reducing stations. Applicable to large plant heating or process.—**NIAGARA BLOWER CO.**

**336—Retaining Walls** — Catalog RW 3555 shows how bin-type walls stabilize slopes and gain valuable ground for buildings, parking areas; all metal cellular construction; all-bolted assembly means small crews can do the job.—**ARMCO DRAINAGE & METAL PRODUCTS, INC.**

**363—Magnetic Separators** — Catalog 910 covers wet concentration and magnetic recovery. Various types and sizes shown as well as typical installations and machines.—**JEFFREY MFG. CO.**

**388—Rigid Frame Buildings**—3 page bulletin "Dixisteel Rigid Frame Buildings" — low cost, flexibility of design, durability, and minimum maintenance; also triangular or bow-string truss all-steel roof systems; fabricated for rapid erection.—**ATLANTIC STEEL COMPANY.**

## **PIPING, VALVES, FITTINGS STEAM SPECIALTIES, TRAPS**

**406—Blow-Off Valves** — Catalog B-434 describes the valve to use for boilers to 2500 psi. Disc has welded-in stellite facing and inlet nozzle has integral welded-in heavy stellite seat.—**YARNALL-WARING COMPANY.**

**413—Reducing Valve** — Bulletin 553 gives graphic performance com-

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parison and capacity data of the new "Hi-Flo" valve for water reducing stations, fuel oil pressure control, process lines, etc. — LESLIE CO.

**417—Welding Fittings** — 192 page Cat. 54 gives design data on piping and piping application including digests of specifications, working pressures, design formulas, etc. Covers welding fittings, prefabricated pipe, forged steel flanges, and pipe coils. — MIDWEST PIPING COMPANY, INC.

**421—Air and Gas Traps** — 8 page Bulletin No. 289 describes complete line of ball float traps for draining water from air, gas or steam lines or draining a light liquid from a gas under pressure (for pressures to 900 lb). Includes: installation, selection and ordering information. — ARMSTRONG MACHINE WORKS.

**427—Diaphragm Valves** — Valves for common and corrosive services described in Circular AD-1942. Have independent seating and bonnet sealing. — CRANE CO.

**433—Insulation** — Industrial glass fiber duct and pipe insulations described in Fact Folder 11. Stocks immediately available for fast, accurate delivery. — REYNOLDS ALUMINUM SUPPLY CO.

**437—Piping for Permanence** — Bulletin covers a variety of services where wrought iron pipe saves because it serves longer. Corrosion costs you more than wrought iron. — A. M. BYERS COMPANY.

**440—Jacketing "Check-Charts"** — To help you estimate your aluminum jacketing requirements, manufacturer offers easy-to-use "Quick Check Charts" for .008, .016 and .020 jacketing. — ASECO, INC.

**452—Pipe and Tubes** — 42 page Bulletin 26 gives types of steel tubes, tensile, creep and rupture properties, welding and forming data, applications and other valuable data—National Tube Div., UNITED STATES STEEL CORP.

**456—High Alloy Castings & Pipe** — Bulletin 3354G explains how static and centrifugal casting & pipe offer maximum resistance to heat and corrosion. — THE DURALOY COMPANY.

#### MAINTENANCE PACKING GASKETS, LUBRICATION

**507—Power Sweepers** — Folder describes the "704," a compact unit for small plant budgets; designed for congested areas and narrow aisles; gasoline, LP gas or battery

powered. — WAYNE MANUFACTURING COMPANY.

**513—Conveyors Belt Repairs** — Bulletin R-700 and Folder R-4 describe the "Rema" method of making vulcanized repairs without heat. Holes, gouges, rips and tears can be repaired on the job. Curing time delay is eliminated. Belts can be put into service immediately after repair is made.—FLEXIBLE STEEL LACING COMPANY.

**527—Wear-Free Packings** — File No. DMSP describes complete line of metallic and semi-metallic packings. — DURAMETALLIC CORPORATION.

**529—Valve Maintenance** — Folder describes the Dexter power-driven, one-man operated valve-in-line reseater. Average grinding time 4 min. Grinding heads for all angles; sizes ¼" thru 12"—THE LEAVITT MACHINE COMPANY.

**566—Tube Expanding** — Bulletin 55 on torque control describes automatic air driven tube expander drive. Control assures uniformity of tube expanding. — THOMAS C. WILSON, INC.

## KEEP UP-TO-DATE USE SPI READER SERVICE

**570—Multi-Purpose Grease** — Bulletins describe new single product Gulfcrown grease (4 consistencies) that does the work of many — simplifies application and avoids errors, reduces inventory and cuts lubrication costs; grease gun or centralized system application. — GULF OIL CORPORATION.

**590—Steam Line Treatment** — Folder describes alkaline IPCO-S-L-T. Used in boiler water it will volatilize and travel with steam to return lines. Prevents costly repairs and provides insurance against replacing pipe and fittings. — INDUSTRIAL PRODUCTS CO.

#### ENGINES, DRIVES POWER TRANSMISSION MATERIALS HANDLING

**614—Vertical Transportation** — Elevator Catalog — Describes and illustrates details of passenger and freight elevators, escalators, dumbwaiters, and modernization and maintenance equipment for use in industrial, utility and service plants. — OTIS ELEVATOR CO.

**629—Longer V-Belt Life** — 12 page Bulletin 20 x 6234C describes various types of V-belts and tells how to select and match them. Lists seven steps for correct installation and hints for making them last longer. — ALLIS - CHALMERS MFG. CO.

**630—Mechanical Vibrating Conveyors** — Catalog 890 gives information on conveyability and density of typical solid materials and provides data on how to "Do It Yourself" to get required length. — JEFFREY MFG. CO.

**631—Screw Conveyors** — Catalog ID-541, 68 pages — Illustrates and describes standard and special types of conveyors, with engineering data necessary for selection. Tables give sizes, types, speeds, horsepower and other information. Accessories included. — CONTINENTAL GIN COMPANY.

#### WATER TREATMENT, HEATING VENTILATING, AIR CONDITIONING REFRIGERATION, DUST & FUME CONTROL

**700—Water Conditioners** — 4 p brochure describes Anco water conditioners for hot-water and humidifying systems. Stop rust and corrosion; prevent discolored water. — ANDERSON CHEMICAL COMPANY, INC.

**701—Exhausting Corrosive Fumes** — Bulletin 702-A shows how corrosive fumes can be exhausted with rubber, lead lined or specially coated fans. — CLARAGE FAN CO.

**715—Amine Treatment** — Return line corrosion is a critical problem in maintaining economical, efficient power plant operation. Bulletin CP-100 shows how amine treatment is an easy, effective and economical way to eliminate pipe corrosion problems. — THE BIRD ARCHER COMPANY.

**725—Cooling Tower** — 32 p Bulletin DT-57-1 describes induced-draft counterflow cooling tower. Describes construction and operation of all major parts, effects of recirculation and surrounding. Illustrated. — FOSTER WHEELER CORP.

**745—Dust & Fume Control** — 40 p booklet gives helpful information on recovering dusts, fly ash, mists, fumes and other suspensions of gases. Summarizes important points design and plant engineers should know about electrical precipitators.—WESTERN PRECIPITATION CORPORATION.

**774—Refrigerating Units.** — Bulletin 97-F illustrates and describes

# DON'T GIVE UP!

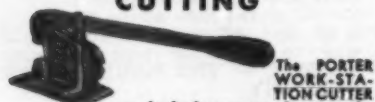
—ON THAT  
TOUGH  
METAL-CUTTING  
PROBLEM!  
USE



If it's a "hard-to-figure-how" metal-cutting job, — there is a PORTER CUTTER that can handle it for you, with amazing speed, and lowest possible cost. In the versatile PORTER line there are 108 different hand-powered cutters, each one designed to do a particular job, or jobs — to cut some type or size or shape of metal fast and cheap, including BOLTS, RODS, SCREWS, RIVETS, WIRE, CHAIN, SOFT, MEDIUM AND HARD METALS, STEEL STRAPPING, and many others. These rugged cutters exert up to 20,000 pounds cutting pressure — make hard work easy, cut labor costs as much as 97%! Want profitable proof? Write for the PORTER catalog.

Illustrated above — is the famous PORTER CENTER-CUT CUTTER. The leading all-round cutter for industrial production. 9 sizes — up to 3/4" capacity.

## for "PRODUCTION" CUTTING



The PORTER WORK-STATION CUTTER — in 3 sizes — can increase the output of one man up to 300% in continuous volume cutting, up to 1/2" capacity.

## for THOSE RUGGED JOBS!

## PORTER HEAVY DUTY CUTTER

Cuts almost anything in metal — up to 3/4" diameter — thanks to its heat-treated, heavy-forged straps, and hard-tempered, center-cut jaws. Available in 3 sizes.

### WRITE FOR CATALOG

It should show you the way to the solution of your metal-cutting problem.

Contact your Industrial Distributor for Service

**H. K. PORTER, Inc.**

Somerville 43, Mass.

## Bulletins (Con'd)

low-pressure refrigerating units. — FRICK CO.

### ELECTRICAL

**801—Motors**—Bulletin describes and catalogs more popular a-c motors from 1 to 600 hp, for every process and manufacturing requirement. Single phase and polyphase; surpass NEMA specifications. — BROOK MOTOR COMPANY.

**802—Small Relays**—Simple solenoid design with only one moving part described in Bulletin 700. Silver alloy contacts need no cleaning, filing, or other maintenance. — ALLEN-BRADLEY CO.

**803—Shielded Electrification**—Bulletin KS-1 describes "Kant Shock" for monorail and crane systems. Shielding prevents accidental contact with live bus bars. Eliminates all hazards of open bar conductors, prevents costly accidents, protects employees and reduces insurance rates. — AMERICAN MONORAIL CO.

**805—Power Factor Correction** — 24 page catalog 50B shows how you can cut power costs by installing correction capacitors on motors and other inductive electrical equipment. Greater loads can be handled from existing circuits. Wiring, transformer and switchgear costs can be greatly minimized in new installations. — SPRAGUE ELECTRIC CO.

**821—Electric Strip Heaters** — Bulletin F-1566 shows how to quickly and easily bolt or clamp Chromalox strip heaters to platens, dies, kettles, tanks, etc., for advantages obtained with electric heat. — EDWIN L. WIEGAND COMPANY.

**854—Adequate Wiring** — Booklet "Wire Ahead" — Discusses preventive maintenance in electrical systems — the symptoms of inadequate wiring — and plans for anticipating electrical demands. — ANACONDA WIRE & CABLE COMPANY.

**862—Motor Starters** — Manual, auto-transformer type recommended where characteristics of driven load or power company rules require reduced voltage starting. Details in Bulletin 646. — ALLEN-BRADLEY.

## FUTURE EVENTS of Engineering Interest

**April 1-3: Instruments & Regulators Conference.** American Society of Mechanical Engineers, University of Delaware, Newark, Del.

**April 9-11: Fifth Annual Conference on Accident Prevention Engineering.** University of Florida, Gainesville, Fla.

**April 14-15: Maintenance & Plant Engrg. Conference.** American Society of Mechanical Engineers, Penn-Sheraton Hotel, Pittsburgh, Pa.

**April 14-18: Annual Show & Conference.** American Welding Society, St. Louis, Mo. AWS, 33 West 39th St., New York 18, N. Y.

**April 16-18: Natural Gasoline Assoc. of America.** Annual Convention, Baker and Adolphus Hotels, Dallas, Texas.

**May 1-2: Metal-Cutting Review Seminar.** American Society of Tool Engineers, Bellevue-Stratford Hotel, Philadelphia, Pa. ASTE, 10700 Puritan Ave., Detroit 38, Mich.

**May 1-8: 26th Annual Meeting.** American Society of Tool Engi-

neers, Philadelphia Convention Center, Philadelphia, Pa. Richard Gebers, Public Relations Mgr., ASTE, 10700 Puritan, Detroit 38, Michigan.

**May 11-15: Oil & Gas Power Conference & Exhibit.** American Society of Mechanical Engineers, Bellevue-Stratford, Philadelphia, Pa.

**May 12-16: Southwestern Metal Exposition.** State Fair Park, Dallas, Texas. W. H. Eisenman, Mgr. Dir., 7301 Euclid Ave., Cleveland 3, Ohio.

**May 13-15: American Institute of Electrical Engineers.** East Central District Meeting, Huntington, W. Va.

**June 6: Public Utilities Accident Prevention Conference.** Public Utilities Association of the Virginias, Hotel Roanoke, Roanoke, Va.

**June 9-12: Material Handling Institute Exposition.** Public Auditorium, Cleveland, Ohio. Clapp & Poliak, Inc., 341 Madison Avenue, New York 17, N. Y.

June 15-19: Semi-Annual Meeting, American Society of Mechanical Engineers, Statler Hotel, Detroit, Mich.

June 23-25: Joint Meeting, American Society of Heating & Air-Conditioning Engineers, Inc. and American Society of Refrigerating Engineers, Hotel Leamington, Minneapolis, Minnesota.

Aug. 7-9: North Carolina Hospital Engineers Association, Inc., Annual Convention, Sir Walter Hotel, Raleigh, N. C. Henry W. Miller, Pres., NCHEA, Oteen, N. C.

Sept. 15-17: American Institute of Electrical Engineers, Petroleum Industry Conference, Baker Hotel, Dallas, Tex.

Sept. 15-17: Process Industries Conference, American Society of Mechanical Engineers, Statler Hotel, Buffalo, New York.

Sept. 18-21: 40th Annual Meeting, Public Utilities Association of the Virginias, Greenbrier Hotel, White Sulphur Springs, W. Va. R. W. McKinnon, Exec. Secy., PUAV, 602 First Federal Bldg., Roanoke, Va.

Sept. 28-Oct. 1: Power Conference, American Society of Mechanical Engineers, Statler Hotel, Boston, Mass.

Sept. 29-Oct. 3: American Society of Tool Engineers, Semi-Annual Meeting & Western Tool Show, Shrine Exposition Hall, Los Angeles, Calif.

Oct. 13-15: National Electronics Conference, 14th Annual Forum on Electronic Research, Development, and Application, Hotel Sherman, Chicago, Ill. R. E. Hornacek, Pub. Committee Chairman, NEC, c/o Ill. Bell Telephone Co., 208 West Washington St., Chicago 6, Ill.

Oct. 14-16: 13th Annual Exposition, Society of Industrial Packaging & Materials Handling Engineers, Coliseum & Morrison Hotel, Chicago, Ill. G. Cornwall Spencer, 327 S. LaSalle St., Chicago 4, Ill.

Oct. 20-21: Southeastern Electric Exchange, Engineering & Operation Section, Hotel Roanoke, Roanoke, Va.

Nov. 30-Dec. 5: Annual Meeting, American Society of Mechanical Engineers, Statler & Sheraton-McAlpin Hotels, New York, N. Y.



## The First TEFLON GEAR PUMP

AVAILABLE FOR  
IMMEDIATE DELIVERY

### FOR NON-LUBRICATING AND CORROSIVE FLUIDS

*You asked for it...*

and Eco is the only manufacturer who has made it available. The first self-priming rotary gear pump suitable for non-lubricating and corrosive fluids is now available for immediate delivery. The pump, with  $\frac{3}{4}$ " P.T. inlet and outlet ports, features housings of 316 or Carpenter 20 stainless steel, Hastelloy C or nickel, with reinforced Teflon gears and internal Teflon bearings and packing.

*Designated the GearChem\**, this pump is suitable for speeds to 1750 rpm at capacities to 10 gpm and pressures to 100 psi. Viscous media to 5000 SSU can be pumped at reduced speeds.

*The GearChem* created tremendous interest at the recent Chemical Show. In addition to proportioning and metering applications the pump is ideal for general process work in pilot plant and production operations.

Write for prices and complete information.

\* T.M. Applied For

Teflon—duPont trademark

# ECO

*the big name in small pumps*

MArket 4-6565

## ENGINEERING CO.

12 NEW YORK AVE.  
NEWARK, N. J.



## Liquid Heating Problems?



### Your Chromalox Man has the ANSWERS

Backed by the industry's most complete line of electric heaters, he has heaters specifically designed for oils, water, asphalt, paraffin, salt baths, corrosive solutions and heat transfer media. Standard heaters are ready for immediate shipment from the world's largest stock.

Call your Chromalox Sales-Engineering Representative for clean, safe, economical Electrical answers to all your heating problems. Or, write to:



**Chromalox Electric Heat**

Edwin L. Wiegand Company  
7563 Thomas Blvd. • Pittsburgh 8, Pa.

## Southern News Briefs — Continued from Page 8

### Hasselbring Promoted by Reynolds Aluminum Supply

Rae E. Hasselbring has been appointed General Manager of the Warehouse Division, Reynolds Aluminum Supply Company.



Hasselbring joined Reynolds Aluminum Supply Company in 1955 as Manager of Industrial Metals Sales. In 1956, he was promoted to the position of Sales Manager of the Company's Warehouse Division. As General Manager of the Warehouse Division, Hasselbring will assume responsibility for the operation of the Company's nine warehouse facilities, as well as establishing sales and merchandising policies.

Reynolds Aluminum Supply Company, the South's largest combined industrial metals and building materials distributor, is headquartered in Atlanta, Georgia. The Company operates warehouse facilities in Atlanta and Savannah, Georgia; Miami, Florida; Richmond, Virginia; Raleigh, North Carolina; Louisville, Kentucky; Memphis and Nashville, Tennessee; Birmingham, Alabama; with a Sales Office in Jacksonville, Florida.

### Stone & Webster — Tex.

John W. Crocker, a member of the Mechanical Division staff of Stone & Webster Engineering Corporation has been named manager of the Stone & Webster district office in Houston, Texas.

An expert in the design and construction of pulp and paper mills, Mr. Crocker has had experience in consulting work on power plants and the engineering and erection of various industrial facilities.

### Kaiser Aluminum — Atlanta

R. A. McDuffie has been named electrical conductor sales supervisor in the Atlanta district for Kaiser Aluminum & Chemical Sales, Inc.

Mr. McDuffie joined the company four years ago as a sales trainee and since 1956 has been a resident salesman at Jackson, Miss.

### Aseeco Jacketing Offers Engr. Service — Atlanta

Associated Sales Engineers, 3437 Rockhaven Circle, Atlanta, Georgia have been appointed Aseeco aluminum jacketing engineering aides to Southeastern industry. J. E. Blow and Don Riggsbee, serving the established Aseeco jacketing distributors in the area, will be working with engineers writing specifications and lending assistance to distributors, insulation contractors, users and prospective users of Aseeco aluminum jacketing.

Aseeco, Inc., is a division of Associated Engineering & Equipment Company of 2910 Crawford, Houston 6, Texas. Edward J. Tracey is vice president and sales manager of Aseeco. The jacketing is extensively used for insulation protection for lines, tanks, towers and vessels.

### Miami Warehouse Mgr. for Reynolds Aluminum Supply

Robert P. Jourdan, Jr. has been appointed Manager of the Miami warehouse operation for Reynolds Aluminum Supply Company, the South's largest combined industrial metals and building materials distributor.

A native of Tampa, Florida, Jourdan joined Reynolds Aluminum Supply Company's Atlanta General Office organization in 1956 as Manager of Industrial Metals Sales. Prior to this time, he served as Miami Branch Manager and Assistant General Manager, respectively, for Florida Metals, Inc. of Tampa.

In addition to Miami, Reynolds Aluminum Supply Company operates metals and building materials warehouse facilities in nine other leading Southern industrial centers.



## Dresser — Washington, D. C.

J. B. O'Connor, president of Dresser Industries, Inc., has announced the appointment of Wm. E. Dobbins as Director of Dresser's Washington Office. The position was formerly occupied by the late Gen. Urban Niblo, who passed away in August.

Dobbins goes to the Washington post from Houston, Texas where he has been Central Regional Manager for Clark Bros. Co., one of the Dresser Industries, for the past two years. Mr. Dobbins will make his headquarters in Suite 401, The Folger Building, 725 15th Street, N.W., Washington 5, D. C.

## Gulton Industries Open Atlanta and Miami Offices

Kenneth Gans has been appointed Atlanta district sales manager and Ira Schulman Miami district sales manager for Gulton Industries, Inc., Metuchen, New Jersey.

Gulton Industries is an electronics manufacturer and is also a leader in the development and production of ultrasonic equipment and systems. Company's product lines include: porcelain enamel coatings; meters; censing, controlling and recording instruments; power supplies; transformers; amplifiers, etc.

## Milton Roy Representatives

Milton Roy Company has assigned three new engineering representatives to handle the needs of southern and southwestern customers for controlled volume pumps and chemical instrumentation systems.

New representatives include **Bernhard Engineering Sales Co.**, 309-11 Meadows Building, Dallas, serving North Texas; **Tate Engineering, Inc.**, 13 West 14th St., Richmond, for the state of Virginia; and in the central and southern part of Kentucky, **Jay Instrument and Specialty Co.**, with offices at 3307 Camp Ground Road, Louisville.

## Tube Turns — Southwest

Promotion of Donald A. Drake to Southwestern district manager for **Tube Turns Plastics, Inc.** with headquarters at (7714 Wedgewood Lane) Houston, Tex.

719-7

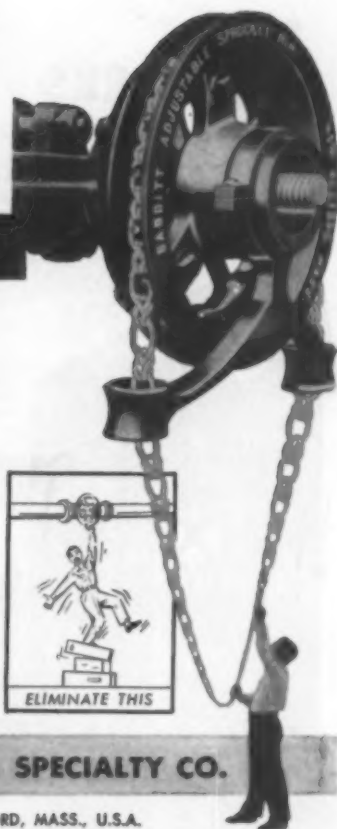
## Safe Operation Of OVERHEAD VALVES

with a

# Babbitt

Adjustable  
SPROCKET RIM  
with Chain Guide

- Simplifies pipe layout
- Fits any size valve wheel
- Easy to install and operate
- Operates any valve from plant floor
- Time and money saving fixture
- No maintenance; first cost only cost
- Packed, completely assembled, one to a carton
- Hot galvanized, rust-proof chain available for all sizes
- Easy to follow instructions with each unit
- Your supplier carries complete stocks
- Write for new descriptive catalog sheet and prices



# Babbitt

 STEAM SPECIALTY CO.

3 BABBITT SQUARE, NEW BEDFORD, MASS., U.S.A.

## REDUCE OPERATING COST of VACUUM SYSTEMS with this "AERO" (air-cooled) VAPOR CONDENSER

With free air the cooling medium you use the least water, evaporated in the air stream. You save the cost and pumping of large volumes of condensing water.

Air-vapor subcooling reduces mixture evacuated from the system, saving in the operation of steam ejector or vacuum pump.

This air-cooled condenser gives you more capacity than other types at a substantial saving of steam and power. Water supply, scaling treatment and disposal problems are eliminated.

You get pure condensate, an improved product; often make a profit on recovery of residues now wasted. There can be no contamination of your product at any time; it never touches raw water. Condensing, of water, of solvents or of your product, is simplified; you have one, compact,



Niagara  
Aero Vapor  
Condenser.  
This compact  
machine may  
be installed  
directly above  
stripping  
column or  
vacuum  
evaporator.

easily maintained unit replacing both cooling tower and barometric or surface type condenser.

Maintenance expense is low. Balanced Wet Bulb Control provide precise, year 'round adjustment of capacity to load.

Constant temperature, uniform products and maximum production 12 months a year are assured. Unit capacities up to 15 million BTU.

Write for full information. Ask for Bulletin 129R

## NIAGARA BLOWER COMPANY

Dept. SP-4, 405 Lexington Ave., New York 17, N.Y.

Niagara District Engineers in Principal Cities of U. S. and Canada

# X MARKS THE CRITICAL SPOTS!



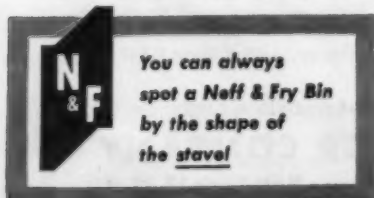
**It takes  
more than muscles to  
build a storage bin**

Before the physical work of building a bin begins, we must know the problems involved at the **Three Critical Points**.

- X What is the loading problem?
- X What are the characteristics of the material to be stored . . . and its "flowability"?
- X What is the volume and rate of discharge?

When planning your next storage bin, may we sit in on the very early stages of planning?

**NEFF & FRY COMPANY**  
330 Elm St., Camden, Ohio



## Southern News Briefs (Continued)

### Maryland Shipbuilding & Drydock Co.

Charles F. Willis, who has been associated with the **Maryland Shipbuilding & Drydock Company** for over 16 years, the last eight as Chief Engineer, has requested early retirement for reasons of personal health. At the Company's request, Mr. Willis will serve as a Consultant to the Company pending the completion of certain engineering projects.

Walter R. Gerich has been appointed Chief Engineer, in which capacity he will be in charge of all mechanical and electrical engineering.

Mr. Gerich is a graduate of the U. S. Naval Academy and the Massachusetts Institute of Technology, having received the degree of Naval Engineer from the latter institution. For the past seven years has had extensive experience in the Navy in the Norfolk Naval Shipyard and the Bureau of Ships in Washington, embracing both the production and design aspects of ship construction and repair.

Freeman W. Lohr has been appointed Plant Engineer, in which capacity he will be in charge of all plant construction, maintenance, and repair.

For the past nine years Mr. Lohr was associated with the Public Service Electric & Gas Company as a member of their engineering staff. Prior to that association he was in the Engineering and Construction Division of the Koppers Company.

### Green Fuel Officers

The **Green Fuel Economizer Company**, Beacon, New York, manufacturers of fans, economizers and dust collectors, has announced the following changes in corporate officers: **Allan Davies**, formerly President becomes Chairman of the Board; **Bernard de Turenne** becomes President and Treasurer; **Gert V. Eiserman**, former Sales Manager becomes Vice President in charge of Sales; **Russell H. Kraft** is named Vice President in Charge of Engineering; and **Donald S. Gordon** is named Vice President of the Contract Division with offices in Baltimore.

### Airtronics Plant — Fla.

Robert J. Brown has been named Plant Manager of **Airtronics International Corporation's** Hialeah, Florida plant manufacturing precision gears and plastics components and assemblies for the aircraft and guided missile program. **Robert G. Kramer** is president.

### Dresser Acquires Gardner-Denver Co.

The **Gardner-Denver Company** has been acquired by **Dresser Industries, Inc.**, of Dallas, Texas, according to a joint announcement by H. N. Mallon, Chairman of Dresser and Ralph Gardner and G. V. Leece, Chairman and President of Gardner-Denver, respectively.

Gardner-Denver produces compressors, pumps, rock drills and air tools. It will be combined with four present subsidiaries of Dresser to form a new wholly-owned subsidiary of Dresser Industries, Inc., known as **Gardner-Dresser Company**, of which G. V. Leece will be chief executive officer.

Companies that will form Garner-Dresser, in addition to Gardner-Denver, are Clark Bros. Co., Pacific Pumps, Inc., Roots - Connersville Blower Div.; and Ideco, Inc.

Major product lines of this new unit will be stationary and portable compressors, reciprocating and centrifugal pumps, blowers and exhausters, pneumatic tools and mining and oil well drilling equipment.

### Wright Industrial Products — Houston

**Wright Industrial Products** has announced the appointment of **N. Gene Simpson** as manager of the Houston office.

Mr. Simpson brings to this new position eleven years experience in the field of sales engineering. Previously he was employed by Manning, Maxwell & Moore, Inc.

Wright Industrial Products is engaged in the marketing of control instruments for aircraft and petrochemical plants, also supervisory control systems for pipe line and water distribution systems.

**pd**

**"Why Not Play Safe And  
Buy Your STACK As  
You Buy Your Car?"**



"Joe, you wouldn't buy the engine of your car from one manufacturer, the wheels from another and the body from still another, would you? Neither would I. And when I design for induced draft, I specify a P-D Stack because the I.D. Fan, though it is important, isn't the whole story. The combined breeching, stack and fan, built as ONE apparatus, gives me unit responsibility, compact design, simplified engineering, and positive performance, with a lot less purchasing details.

"Another thing, I'd rather buy my Dust Collector from the same manufacturer that made my Stack and Fan. For this is all part of the same system for handling the gas after it leaves my boiler unit.

"There's nothing like putting all the responsibility on ONE manufacturer's shoulders if you can, for then you'll come out on the long end nine times out of ten. Buying such equipment piece-meal is antiquated and costly."

You can save a lot of time, trouble and money by purchasing your Stack and Dust Collector from Prat-Daniel.

Write for data.



Project Engineers

**THE THERMIX CORPORATION**

GREENWICH, CONN.

(Offices in 38 Principal Cities)

Canadian Affiliates: T. C. CHOWN, LTD., Montreal 25, Que.

Designers and Manufacturers

**PRAT-DANIEL  
CORPORATION**

P. O. Box 1189-3 SOUTH NORWALK, CONN.

POWER DIVISION: Tubular Dust Collectors, Forced Draft Fans,

Air Preheaters, Induced Draft Fans, Fan Stacks

SOUTHERN POWER & INDUSTRY for APRIL, 1958

**HIGH SCHOOL  
burns waste**

**in a Plibrico INCINERATOR**



#### ARLINGTON HEIGHTS HIGH SCHOOL

serves over 1700 students in a typical fast growing suburban community. With 1600 pupils eating lunch in the school cafeteria, milk cartons, napkins, paper plates and food waste add to the ordinary school refuse. Disposal is clean, quick, and efficient for all waste, wet and dry, is burned in the school's Plibrico portable incinerator.

Ruggedly built, inside and out, factory assembled Plibrico portables have capacities up to 500 lbs./hr. For greater capacities, choose from a wide selection of standard designs covering all types of combustible refuse; they're expertly erected by competent crews on the job site. End the woes of waste . . . costly hauling, fire hazards, lost space . . . with a soundly constructed Plibrico incinerator.

*You can determine the model you need with the handy table in our complete catalog. Write for a copy, or call your local Plibrico man.*

**Plibrico INCINERATORS**

PLIBRICO COMPANY • CHICAGO 14, ILL.  
Plibrico Sales & Service in Principal Cities

For more information, use Reply Card—Page 97

105



# DEOXY-SOL

## SOLUTION OF HYDRAZINE

Oxygen-  
Scavenger

for

Boiler Water  
Treatment

**FAIRMOUNT**  
CHEMICAL CO., INC.

136 Liberty St., New York 6, N. Y.

Ask for pamphlet BW-7

## Southern News Briefs (Continued)

### B & W Refractories

Robert P. Stuntz is assistant sales manager of The Babcock & Wilcox Refractories division, with headquarters in New York. Mr. Stuntz joined B & W in 1940 as a plant engineer at the company's Augusta, Georgia works and since 1946 has been district sales manager of the Chicago district sales office.

### Carboline — St. Louis

In line with a general expansion program, the Carboline Company of St. Louis, Mo., manufacturers of corrosion resistant protective coatings and linings, has announced the moving of their general office and research laboratory to a recently completed new building at 32 Hanley Industrial Center, St. Louis 17, Mo.

Almost triple the space of their old location, the new laboratory is modern in all respects.

### Works Manager for Peerless Pump Div.

John F. Van Dam has been appointed to the newly-created post of Los Angeles Works Manager of Peerless Pump Division, Food Machinery and Chemical Corporation, Los Angeles and Indianapolis.

Moving up from his position of Production Manager, Van Dam now assumes responsibility for supervision of works manufacturing, accounting, industrial relations and all engineering activity.

Floyd W. Widener, Los Angeles Factory Manager has been delegated the added responsibility of serving in an advisory capacity to division management throughout the Division on matters of production, in addition to his continuing position as L. A. Factory Manager.

### G-E Industrial TV Sales & Service — Atlanta

Establishment in Atlanta, Georgia of a District Sales & Service headquarters for Closed Circuit Television has been announced by the General Electric Company.

The new headquarters, resulting from the growing demand for closed circuit TV in industry, education and government, will be headed by Manfred M. Haertig, a TV Specialist with General Electric's Technical Products Department, Syracuse, New York. Mr. Haertig will be responsible for Sales and Service operations in the Southwest and South Atlantic states.

### Ward Leonard — Ga. & Fla.

Ward Leonard Electric Co., Mount Vernon, N. Y. has appointed Roger W. Allen, 1000 Peachtree Street, N.E., Atlanta and J. J. Galleher, 617 Cleveland Street, Clearwater as its Sales Representatives in Georgia and Florida respectively.

Mr. Allen and Mr. Galleher were formerly associated with C. B. Rogers and Associates, Atlanta, Georgia. Mr. Rogers whose company has represented Ward Leonard for the past seventeen years has retired but will continue as a consultant.

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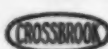




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For more information, use Reply Card—Page 97

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## Southern News Briefs (Continued)

### Lincoln Electric — Atlanta

J. Howard Petty and Ronald C. Pierce have recently joined The Lincoln Electric Company's district office at Atlanta, Georgia. Both of these men completed a one year training program at Lincoln Electric's plant in Cleveland, Ohio, before joining the district office.

### Plant Supt. for Southern Pipe Coating

A. B. Aycock has been named plant superintendent for Southern Pipe Coating Company. He will be in charge of all pipe coating and wrapping work done at the company's 17 acre facilities in Doraville, Ga., an Atlanta suburb.

### Briner Paint Expands Industrial Division

James M. Hammock, Vice President in charge of Sales of the Briner Paint Manufacturing Company of Corpus Christi, has announced that Felix Kelinske who has been with Briner for the past 5½ years, doing research, formulating, and technical service work, has transferred to Baton Rouge, Louisiana to assume the duties of Industrial Sales Representative for Briner in the Louisiana territory.

Paul H. Laudadio, formerly Industrial Sales Representative, has been promoted to Industrial Sales Manager. Laudadio will divide his time between the Corpus Christi and Baton Rouge sales offices.

## Industrial Lighting

(Starts on Page 78)

production may not be readily recognized.

Highlights and shadow have definite advantages. Without them, architectural beauty of columns, grills or other structural ornamentation would be minimized. Sculptured objects would appear flat and uninteresting. Shadows help us to determine the shape of objects — to tell whether they are flat, triangular or round.

But in the factory deep, heavy shadows are seldom desirable. They may conceal the danger of a rapidly moving part of a machine or a hazardous location such as an object in a walkway over which one may stumble. Dark shadows may cause undesirable brightness contrasts which could interfere with visibility at work areas.

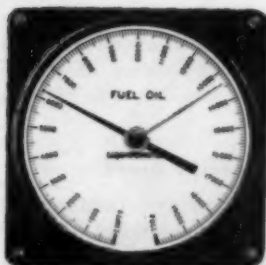
Shadows result from light sources which are small in area. For example, the sun is relatively small compared to the total area of the sky. Therefore, we have sharp, well-defined shadows on a sunny day. On a cloudy day, the entire sky becomes a light source, large in area. The shadows then are minimized or totally eliminated.

Those that may exist are soft and feathery-edged.

With a modern well-designed lighting system in an industrial plant, the many fluorescent fixtures provide a large-area source of light. Shadows are minimized and of desirable quality. Danger from dark, concealing shadows is eliminated.

### Hazardous Locations

There are many industrial locations which require special lighting equipment other than from the standpoint of the illumination they provide. But because of the nature of the area they serve, they require special safety considerations. Explosive conditions caused by vapors, dust or gases require lighting equipment which encloses electrical parts which may cause ignition of inflammable atmosphere. Adequate shielding must be provided for lamps which might be broken accidentally while burning. Even though the lamp will not be operating after breaking of the bulb, the heat from the lead-in wires may still be above the ignition temperature of the flammable gas or vapor-air mixture which will ignite solely by heat. Dust and vapor-proof fixtures are available which not only insure against ignition of gas, dust and vapor but

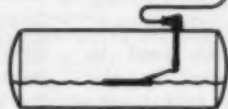


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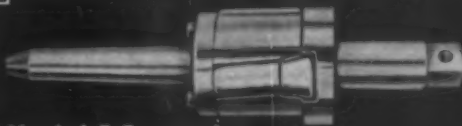
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## Keep boilers on the line with **WILSON** TUBE MAINTENANCE TOOLS

### 1 Air driven tube cleaners



### 2 Self-feeding tube expanders

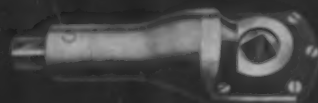


Model E Expanders

3

3A

### 4 Right angle bevel gear drive



1 Heavy-duty air driven tube cleaners are designed to deliver maximum power at the most efficient cutter head speeds while negotiating sharp bends, the Model ECT Air Cleaners are excellent for cleaning curved boiler tubes from 2½" to 4½" O.D.

2 Wilson Model 38 tube expanders are self-feeding and parallel expanding. They are of the single flare roll type. Available for tubes 1" O.D. to 4½" O.D. with various roll lengths for tube seats ¾" and up.

3 Flaring type expander 1" O.D. to 4½" O.D. tubes, ½" to 2" tube seats.

3A Long reach type expander 1" O.D. to 4½" O.D. tubes, 2½" to 5" tube seats.

4 This Wilson bevel gear drive is expressly manufactured to meet continuous and heavy duty service conditions. The one piece all steel body is extremely rigid and not subject to distortion. The maintenance of perfect gear alignment is assured with consequent long service life.

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TW-882

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TUBE CLEANERS • TUBE EXPANDERS





## Plant Lighting — Cont'd

also against accidental breakage of lamp bulbs.

When lamps are to be changed in vapor-proof fixtures, steps should be taken to rid the room of flammable vapors as far as possible to guard against explosive atmosphere being closed in the fixture when the cover is sealed.

Changing lamps in any fixture should be done when there are no workers in the immediate area underneath where a lamp, screwdriver, wrench or other tool, accidentally dropped, can strike the worker.

### Disposal of Lamps

While the phosphorous coating on the inside of fluorescent lamp is not the toxic type used several years ago, the dust created when a lamp is broken for disposal can be hazardous if breathed, as any

other type of dust would be. Moreover, where disposing of several or a large number of old, inoperative lamps, bad cuts might be experienced from broken glass if precaution is not observed. Lamps can be placed in a dampened burlap bag and struck with an appropriate bat or club. A safer way would be to collect them in a corrugated carton and let the city sanitation department dispose of the lot with other waste collection.

### Lighting for Controls

Seldom is thought given to the fact that accidents resulting from overflowing tanks, bursting pipes, etc., may be caused by failure to properly read the details on water columns, pressure gauges or similar control devices. Good lighting at these points is of utmost importance. Care should be used to avoid unshielded lamps in the direct line of vision so that details on gauges or control devices will not be obscured.

Where there are valves to con-

trol pressure or volume of flow, good lighting together with valves painted different colors or otherwise clearly marked will help to avoid errors.

### Specific Areas

One of the common faults found in lighting of stairways is poor lighting of landings. Too often a means of illuminating this area is omitted. Actually, the seeing task at this point is that of seeing on several levels. Thus when walking either down or going up the stairs it is important to clearly see the beginning of the stair riser to avoid missing of footing.

Elevator interiors are too often poorly lighted, inviting missteps on entering or leaving the elevator. Lamps in properly shielded reflectors should be placed to illuminate the area at the entrance to the elevator.

Loading platforms need good seeing to avoid accidents as well as to read labels and handle ma-



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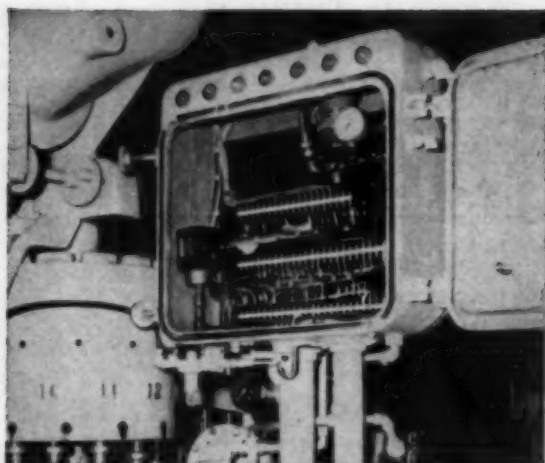
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## Plant Lighting — Cont'd

materials readily. If incandescent lamps are employed, they should be well shielded and spaced to provide uniform illumination over the entire length of the platform. (Spacing should not exceed distance lamps are mounted from the surface of the platform.) Fluorescent lamps in a continuous row the length of the platform will provide good platform illumination.

Unfortunately, a satisfactory method of providing good illumination inside trucks is not now available. Some day, truck builders may provide a row of fluorescent lamps in the upper corners on each side of the wall, protected from breakage by a series of rigid bars. Outlets at platform level could then be plugged in with extension cords to provide current to operate the lamps while loading and unloading.

### Emergency Lighting

Exit lights are required by Safety Codes at stairways and doors leading out from the building so that people can quickly find exits and see their way to safety in the event of an emergency. These lights should be served by a separate source of current from that normally used in the building. Approved automatic devices are available which switch the current source from that normally used to current from a storage battery or a gasoline generator set. These emergency current sources must be periodically checked to insure dependable operation when needed.

### Good Lighting Pays

Today's industrial plant is a far cry from the dark, dingy, inadequate work place of years ago. With mass production, high speed machines and other innovations created by the developments and needs for modern production, good lighting plays an all-important part. In safety, as well as a tool for production, good lighting is indispensable. It serves, too, as a vehicle to provide good house-keeping — a definite asset for

safety as well as making a more pleasant place in which to work.

Figures are often quoted on the tremendous cost of accidents on the highways, in the home and in all other phases of human activities. We may be prone to glance over the figures without much serious thought — perhaps because we can't tie them down to our own particular activity. But if we could determine with even some degree of accuracy the probable cost of accidents in our own plant, we would find that good lighting to prevent them would cost less than nothing.

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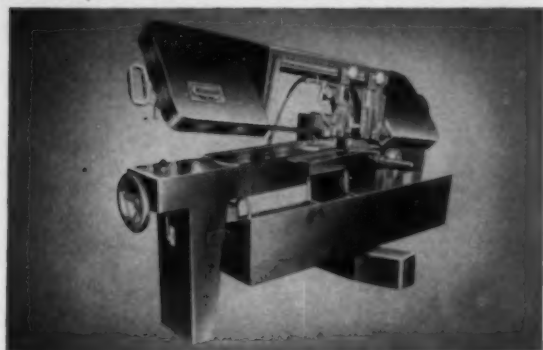
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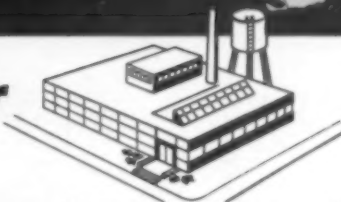
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